

24th EAA Annual Meeting

BARCELONA,
5-8 SEPTEMBER 2018

REFLECTING FUTURES

Abstract Book VOLUME I



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2018
EUROPEAN YEAR
OF CULTURAL
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INDEX OF AUTHORS

Theme: Theories and methods in archaeological sciences

Organisers: Reinhard, Andrew (University of York, Centre for Digital Heritage) - Linde, Lennart (Goethe Universität)

Format: Regular session

Video games, virtual worlds, and other software are digital built environments, which have been constructed by people for other people to inhabit for personal, professional, and commercial reasons. Nearly everyone lives and works within this blended reality mediated by smartphones, tablets, computers, and gaming consoles, spending hours of our waking lives engaging with synthetic spaces and the people present in them. How can archaeologists investigate these born-digital landscapes, sites, and artifacts using and updating archaeological tools, method, and theory to create a community of practice? This session offers presentations of archaeologists actively involved in digital fieldwork, documenting abandonment of virtual spaces, reverse-engineering code for epigraphic/palaeographic study, looking at formation processes within synthetic environments, and recording evidence of digital material culture, paying special attention to the theoretical framework and methodology underpinning those explorations.

ABSTRACTS

01 DIGITAL REMAINS MADE PUBLIC: DEATH ONLINE, DIGITAL MNEMONIC LANDSCAPES AND THEIR IMPLICATIONS FOR ARCHAEOLOGISTS

Author(s): Ulguim, Priscilla (Teesside University)

Presentation Format: Oral

We live in the information age. Our lives are increasingly digitised. The quotidian has been transformed by innovations in networking, computing and the adoption of new technologies. Yet, we not only live and work in a digital environment, we also die and mourn online.

The digital world presents opportunities to investigate new forms of community and material evidence. As we continue to build and use technologies, archaeologists will begin to study the born-digital content of the deceased. Our online activities reveal practices, experiences and engagement with death and new embodiments of funerary practice and agency. The born-digital content of the deceased and digital funerary practices can create digital mnemonic landscapes. New ways of investigating digital death and the dead in these landscapes now enables a "funerary archaeology of the digital".

Furthermore, the use of artificial intelligence capabilities on big data from the billions of interactions between humans and digital devices: conversations, emotions, voices, images, activities, means that concepts such as posthumanism and transhumanism are no longer confined to sci-fi. The potential to "predict" human actions and digitally "reincarnate" the dead provokes a profound theoretical discussion about how archaeologists will curate and manage personal information in the present and future. As more personal data are shared online concerns are raised over rights, privacy, security, ownership and their long-term implications. These concerns extend beyond the living, to the dead.

This paper explores the ethics of a digital public archaeology of the dead in the age of innovation and digital abandonment, while reflecting on the future of our content as a mnemonic space. Archaeologists must consider the theoretical basis of our approach to the investigation of these spaces, to the commercialisation and privatisation of data by corporations, as well as the obsolescence and fragility of digital data.

02 UNDER THE TECH TREE - THOUGHTS ON LINEAR EVOLUTION IN SIMULATION GAMES

Author(s): Linde, Lennart (Goethe University Frankfurt)

Presentation Format: Oral

Technological advancement of mankind is not linear. It is rather a succession of discovery and loss, refinement and degradation. If we really want to plot it we could imagine it as a wavelike curve. But to be honest it is most likely a network of interlaced curves in three dimensional space. To be blunt: It probably cannot be presented without massive simplification. But this is what games have to do. Despite the popularity of non linear gameplay most simulation games have a very linear tech tree that you will advance on. It is further notable that this mirrors in parts Gordon v. Childes influential idea of the urban revolution. Can we therefore state that today's simulation games reflect the state of the art of theory in 1930s archaeology? Should this concern us as archaeologists because games shape the public perception of history to vital degree? And where if not in synthetic worlds is the space to experience technological advancement as a network of interlaced curves in three dimensional space? The paper will make a case to use synthetic worlds to stimulate "out of the box" thinking and handing users the tools to perceive new and more challenging experiences of history.

03 SOLVING THE UNSOLVABLE: IMPOSSIBLE PROBLEMS AND ATARI 2600 CODE REUSE

Author(s): Aycock, John (University of Calgary)

Presentation Format: Oral

In developing methodology for archaeogaming, it is important to have exemplars of techniques that work for analyzing digital artifacts, but it is equally important to understand the limitations of techniques. For example, analyzing retrogame code by reverse engineering is typically presented as a *fait accompli*, a successful endeavor. But this belies the fact that there are questions that arise when reverse engineering code whose answers are either provably impossible or computationally hard to find. Furthermore, there can be a fine line between easy and incredibly hard problems.

For concreteness, we consider the practice of programmers reusing code in Atari 2600 games: tracing common fragments of code from one game to others. Given a single chosen code fragment, this is a straightforward task to automate, as we have done for a distinctive code fragment in the 1982 game *Entombed*. On the other hand, identifying and tracing all common code fragments automatically is a problem impossible to precisely answer; we explain why this is such a hard problem. We tackle this problem heuristically instead, using a novel approach to look for all common code fragments in a corpus of 1,897 Atari 2600 games. This involves building analysis tools, visualizing the results, and interpreting key instances of discovered code reuse. Our technique can be generalized to other game platforms. We also show how our solution can potentially lead to automated identification of “interesting” code, which would make it possible to direct analysis to distinctive areas of code in a game corpus rather than rely on serendipity and laborious manual analysis.

04 VRCHEOLOGY AND THE INVESTIGATION OF SKYRIM AS SITE AND LANDSCAPE

Author(s): Reinhard, Andrew (University of York)

Presentation Format: Oral

Bethesda Game Studios published *Elder Scrolls V: Skyrim* in 2011 to wide acclaim as a Nordic-inspired open world ripe for adventuring. In 2017 Bethesda released its virtual reality edition of the game for PlayStation 4 VR, wholly recreating the game as a completely immersive experience. It is the first time a popular 2D game has been redone for 3D VR, fully immersing players in a wintry landscape where they can explore buildings and landscapes dotted with ruins, and can even play at being an archaeologist.

My work goes far beyond archaeological and cultural reception, although it records lessons learned for sharing VR heritage with the public. Experiments included how archaeology can be conducted in VR, and how questions differ between natural and synthetic settings. What data can VR investigations collect and communicate that goes beyond a mere 3D spectacle? How does VR world grapple with traditional phenomenology, either subverting it or redefining it? How can archaeologists reproduce their data for an audience who has access to neither the game or the hardware needed to experience it in VR?

As synthetic worlds continue to evolve and appear as VR environments, archaeologists will be able to engage with them on their own terms as sites and landscapes: digital built environments. How do humans dwell in these spaces? How do they explore and occupy them, and how can they export their in-game experiences to share in the natural world? The future of the archaeology of VR-realized synthetic spaces includes a new kind of phenomenology, psychogeography, and embodied GIS (as first described by Dr. Stu Eve). Testing these methods in a static environment like *Skyrim* will prepare future archaeologists for their investigations of new, procedurally generated, potentially infinite spaces.

05 2B, OR NOT TO BE: RECORDING THE RELIQUARY SYSTEM IN NIER: AUTOMATA

Author(s): Smith Nicholls, Florence (Independent researcher)

Presentation Format: Oral

An action role-playing game with an open world environment, *NieR: Automata* (PlatinumGames 2017) follows main protagonist 2B, an android involved in a proxy war between an alien machine army and human survivors in 11945 AD. The game has a death mechanic which is referred to as the Reliquary System. If a player dies, their body remains on the game map as a corpse and can later be repaired or looted for items. If the game is played with the online network features enabled then the bodies of other players will also be encountered in the game and can be revived or scavenged.

The main aim of my research will be to explore the potential and ethical concerns of recording the location of player deaths in *NieR: Automata* as a form of what Williams and Atkin (2015) have called digital public mortuary archaeology. The phenomenological experience of the reliquary system will also be considered through the theory of the assemblage of play (Taylor 2009) which posits that the phenomenological study of a game should consider the player, gaming platform and virtual space in tandem. Finally, this presentation will question how archaeogaming as a field should practically engage with concepts of digital mortality and immortality.

06 THE ONTOLOGY OF VIRTUAL REALITY IN ARCHAEOLOGY: DE MUL'S DIGITAL CHARACTERISTICS IN VIRTUAL CULTURAL HERITAGE

Author(s): Galt, Alistair (Independent)

Presentation Format: Oral

What is the difference between an interaction, or a transaction, with an archaeological object in real life and one that is entirely in

the digital domain? The relationship between the archaeological and the digital is ontological in nature. The digital realm is a world made up entirely of numbers, programmable laws and post-geographical space. As humans we simply do not fully understand the implications of using the digital realm for our everyday lives. It is both a modernist dream (mass data-crunching and replication) and the realisation of post-modern ideals (the creation of our own worlds). Virtual archaeology has concentrated on the geometry and visual aspects of archaeological residues (Reilly 2014). However the development of Virtual Reality (VR) has serious implications of how we not just visualise but also sense cultural heritage. For example you can see a room far away with VR and be aware of its existence, yet know it doesn't actually exist. We increasingly rely on VR to visualise archaeology and cultural heritage. In transhumanist circles this is seen as aiding the evolution of mankind, while humanists see these developments as subverting the nature of what it is to be human. As VR is part of a reality spectrum, is it possible to understand our relationship to posthumanism as humans with VR? Using VR as a philosophical example I will present four of de Mul's characteristics of the digital realm (multimediality, interactivity, virtuality and connectivity) to present some ontological questions that may provide ideas for a general framework for cultural heritage to follow.

a. A VIRTUAL ARCHAEOLOGICAL VISIT USING A HEAD-MOUNTED DISPLAY AND AN ACTIVE STEREO DISPLAY: AN EXPERIENCE IN A SMALL MUSEUM

Author(s): Melchor Monserrat, Jose (Museo Arqueológico Burriana) - Juan Lizandra, Maria Carmen (Instituto Universitario de Automática e Informática Industrial Universitat Politècnica València) - Benedito Nuez, Josep (Universitat Jaume I de Castellón) - Tipantuña, Giovanni (Universidad Politécnica de Valencia) - Garcia Garcia, Inmaculada (Departamento de Sistemas Informáticos y Computación de Universitat Politècnica València)

Presentation Format: Poster

The Municipal Archaeological Museum of Burriana (Castellón - Spain) in collaboration with the Universidad Politècnica de València and Universitat Jaume I de Castellón is developing applications for heritage interventions. Our aim is to bring heritage to the public through the use of Augmented and Virtual Reality. In this work, we present the development and validation of a Virtual Reality application for showing four pieces of the museum. The users interact with the pieces using their hands (Natural User Interface). The Leap Motion was used for this natural interaction. For the 3D perception, we used a HMD (Head-Mounted Display) (Oculus Rift) and a display with active stereo (using NVIDIA 3D Vision). A comparative study to check the differences between the two types of visualization was carried out. A total of 27 participants from 7 to 65 years old were involved in the study. The users had to interact with the pieces to place them in a certain position. The time required for this task was significantly lower when using the HMD. The HMD was better valued than the active stereo display with respect to 3D quality, preference or ergonomics. The preference for the HMD was independent of gender, profession or age of the participants. Our work and other similar works demonstrate that the use of Augmented and Virtual Reality, especially on mobile devices or HMDs (video or optical see-through) can contribute to improve the experience of visitors in small museums.

081

POLITICAL MATTERS IN PREHISTORY: PAPERS IN HONOR OF ANTONIO GILMAN GUILLÉN

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Lillios, Katina (University of Iowa) - Díaz-del-Río, Pedro (CSIC)

Format: Regular session

Throughout his career Antonio Gilman has been mainly concerned with the role of land, capital and wealth in the emergence of social inequality in prehistoric Europe. He has used his Marxist perspective, always analytical, critical and witty, to confront a prodigious range of topics –the Neolithic of the Maghreb; the relationships between North Africa and the western Mediterranean during the 3rd millennium BC; the Bronze Age of southeast Iberia and La Mancha or the radiocarbon chronology of the Iberian Peninsula. The papers in this session explore the impact of his work and thought in European archaeology.

ABSTRACTS

01 ANTONIO GILMAN AND HIS CAREER: AN INTRODUCTION

Author(s): Lillios, Katina (University of Iowa) - Díaz del Río, Pedro (CSIC)

Presentation Format: Oral

We introduce this session in honor of Antonio Gilman by presenting an overview of his career and principal contributions. Antonio Gilman has been mainly concerned with the role of land, capital, and wealth in the emergence of social inequality in prehistoric Europe. His career, however, was launched with a doctoral dissertation on The Later Prehistory of Tangier, Morocco, which was followed up with a seminal piece a few years later, coauthored with Richard Harrison, on trade between North Africa and the Iberian Peninsula during the 3rd and 2nd millennia BC. Gilman's subsequent research focused on the emergence of social stratification in Europe,

and the Iberian Peninsula, during the Bronze Age, and specifically, on the relationship between land use practices, irrigation, and social evolution. His theoretical contributions include critiques of New Archaeology and functionalism, advocacy of a Marxist approach in archaeology, modelling of an Upper Paleolithic Revolution triggered by demographic and social changes, and critique of the state hypothesis for Bronze Age Iberia. Gilman tethered much of thinking in the fieldwork he conducted in central and southeastern Spain, specifically in Almería, Albacete, and Badajoz. Gilman's impact on different generations of archaeologists has been enduring and far-reaching, through his sociability, respectfulness, commitment to critical thinking, and sustained efforts to serve Iberian archaeology through various projects, including laying the foundations for the digital database of Iberian radiocarbon dates and as editor-in-chief of *Trabajos de Prehistoria*, the principal journal of Iberian prehistoric archaeology.

02 EXPLORING BIASES IN RADIOCARBON CHRONOLOGIES: THE IBERIAN MESOLITHIC-NEOLITHIC TRANSITION IN LIGHT OF ANTONIO GILMAN'S CARBON-14 DATABASE

Author(s): Uriarte, Antonio (Instituto de Historia CSIC) - Fernández Freire, Carlos (CCHS - CSIC) - Vicent García, Juan M. (Instituto de Historia CSIC)

Presentation Format: Oral

One of the many valuable contributions of Prof. Antonio Gilman to Prehistoric Archaeology is the Radiocarbon Database of Iberian Late Prehistory. A result of 36 years of a long-lasting butterfly collector approach to archaeological radiocarbon dates, the Gilman Archive gathers over 9000 dates from more than 1800 archaeological sites in the Iberian Peninsula, mainly of Mesolithic to Iron Age chronologies. In accordance with an open data paradigm, all this information is freely accessible via the Internet. Access is made possible through the IDEArq platform (www.idearq.org), a Spatial Data Infrastructure for the online publication of repertories of geo-referenced archaeological information hosted by the Spanish National Research Council (CSIC).

Our contribution approaches the spatial and chronological distribution of Iberian radiocarbon dates as a proxy for variations in the intensity of research, a slippery accumulative variable frequently assumed as a cause of data bias in interpretative debates, but never accurately objectified. Our inquiry is illustrated taking as a case study the Mesolithic-Neolithic transition, where the hypothetical existence of uninhabited regions during the Mesolithic plays a key role in most accounts. By analysing the spatial and chronological distribution of radiocarbon dates, we evaluate the likelihood that these vacuums are due to regional research biases.

03 LONG-LASTING SACRED LANDSCAPES: THE NUMERICAL CHRONOLOGY OF THE MEGALITHIC PHENOMENON IN SOUTHEASTERN IBERIA

Author(s): Aranda Jimenez, Gonzalo - Sánchez Romero, Margarita - Lozano Medina, Águeda (Dpto. de Prehistoria y Arqueología. Universidad de Granada) - Díaz-Zorita Bonilla, Marta - Escudero Carrillo, Javier (Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters. University of Tübingen)

Presentation Format: Oral

Thanks to the radiocarbon dating programme undertaken in the last five years, it is now possible to explore the chronology and temporality of the megalithic phenomenon of south-eastern Iberia. Ninety new dates have been obtained from the necropolises of El Barranquete, Panoría, Las Churuletas, La Atalaya and El Jautón. Radiocarbon measurements were primarily based on human bone samples selected according to the minimum number of individuals identified in each tomb. Four main conclusions can be drawn from this radiocarbon series modelled in a Bayesian framework: i) the funerary rituals span a very long period that began in 3810-3635 cal BC and ended in 425-690 cal AD, although the mortuary activity was far less intense from the end of the second millennium; ii) the tombs were built at different times and used on different temporal scales, ranging from a few decades to several centuries; iii) although there is a clear chronological sequence between the tholoi and the other types of tomb such as circular tombs (Ründgraber), circular tombs with passages and orthostatic tombs, all were contemporaneous during the 3rd millennium, coinciding with their peak mortuary activity; and iv) the continuity of mortuary practices reached an unexpected importance during the Bronze Age, mainly in the tholos-type tombs.

04 EMBODIED INEQUITY? BIOARCHAEOLOGICAL APPROACHES TO INEQUALITY IN COPPER AGE IBERIA

Author(s): Beck, Jess (University of Cambridge)

Presentation Format: Oral

Traditionally, studies of prehistoric inequality focus on its material traces in the archaeological record, examining evidence such as architecture, patterns of long-distance exchange, craft specialization, settlement hierarchies, and mortuary treatment. Bioarchaeological evidence from the human skeleton provides a unique and complementary counterpoint to such work by examining the embodied dimensions of differences in social status. Osteoarchaeological assessments of age, sex, and skeletal completion can be used to assess the relationship between identity and mortuary treatment, while the paleopathology of ancient bones and teeth provides insight into the intersection of disease and social status. Isotopic analyses of carbon, nitrogen, strontium, and oxygen reveal inter-individual and inter-group differences in diet and mobility. Finally, radiocarbon dating of human bone allows us to examine diachronic changes in social organization and economic, political, and ideological inequalities. Here, I focus on the site of Marroquíes, a 113-hectare Chalcolithic enclosure settlement in Jaén, Spain, to explore how bioarchaeological analyses contribute to contemporary debates about social complexity. The trajectory of the site of Marroquíes and evidence for the lived experiences of the people who inhabited this settlement is contextualized with reference to other large-scale Chalcolithic sites such as Los Millares and Va-

lencina de la Concepción. This paper concludes with recommendations for embedding new bioarchaeological data within the larger context of archaeological investigations of inequality within Iberian Late Prehistory.

05 RETHINKING THE ELITES OF THE IBERIAN CHALCOLITHIC

Author(s): Kunst, Michael (Deutsches Archäologisches Institut)

Presentation Format: Oral

When the first studies of Copper Age fortifications in the Iberian Peninsula were undertaken in the late 19th century, archaeologists, following Louis Siret, characterized them as Near Eastern colonies. Edward Sangmeister and Beatrice Blance amplified this thinking with their colonial model, and excavations at Zambujal, under the direction of Hermanfrid Schubart and Edward Sangmeister, initiated a new era of investigation into the Copper Age of Iberia. Beginning in the late 20th century, Marxist approaches began to be used to understand the emergence of social differences and inequalities in late Iberian prehistory, and local factors were sought to explain these social changes. Antonio Gilman played a major role in this re-thinking with his thesis that, while social inequalities are clearly in evidence in the Copper and Bronze Ages of Iberia, the state did not exist. However, elites or other special people did exist. This paper considers the diversity of the Iberian Copper Age and examines the variability of households and graves found on Copper Age sites, particularly the special burials at Matarrubilla, Pastora, and Montelirio, near Valencina de la Concepción. Who were these special men and women? What kinds of elites lived in the Copper Age of Iberia, who were clearly very different from their contemporary elites in Egypt and Mesopotamia?

06 CIRCULATION OF EXOTIC RAW MATERIALS: IBERIAN AMBER AS A CASE STUDY.

Author(s): Murillo Barroso, Mercedes (Universidad de Granada)

Presentation Format: Oral

Exotic raw materials such as jade, obsidian, rock crystal or amber have aroused an interest in humans since they began making the very first ornaments. There are many aspects that come into play when assessing the social value of these raw materials: on the one hand, "absolute" aspects such as the material's intrinsic physical qualities (colour, texture, appearance...) that can be highly appealing when making ornaments and, on the other hand, "relative" aspects, such as a high abundance or scarcity of these resources which can result in these materials having an added value because they are exotic or 'exclusive'. In this sense, access to these raw materials could have played an important role in the mechanisms of social differentiation, emulation and/or competition of social sectors as well as access and control of flow circuits of these materials.

These circuits are known to have taken place since early dates in Prehistory. We are aware of Lipari and Pantelleria obsidian circuits in Central Mediterranean that reached North Africa between the 6th - 2nd Millennium cal. BC; Alpine jade axes that circulated in Western Europe reached the UK and the Iberian SW since at least the 5th Millennium cal. BC; variscite from the SW of the Iberian Peninsula has been documented in French megaliths from the 4th Millennium cal. BC and Asian and African ivory have been documented in Iberia during 3th Millennium cal. BC.

It is in this context that we present the study of the circulation of amber in Western Mediterranean: based on FTIR analysis of objects documented in Iberia, we present changes suffered in relation to the different origins of the raw material throughout time, the circuits through which this raw material reached the Iberian Peninsula and the role that North Africa played in connecting Iberia with Central Mediterranean.

07 SOCIAL COMPLEXITY IN COPPER AGE IBERIA: DEBATING ANTONIO GILMAN'S IDEAS

Author(s): García Sanjuán, Leonardo (Departamento de Prehistoria y Arqueología)

Presentation Format: Oral

Professor Antonio Gilman has been a leading figure in the study of Spanish Late Prehistory for the past 40 years. His research on Neolithic, Copper Age and Bronze Age societies, whether in the Spanish South-East or La Mancha region, includes a wide number of topics, ranging from spatial analysis (Gilman and Thornes, 1985), to social organisation (Gilman, 1987a; 1987b; 1991; etc.) and exchange (Harrison and Gilman, 1977). This work has exerted a major influence on two generations of Spanish scholars, among whom I count myself. In this paper I will attempt to discuss Antonio Gilman's ideas on Copper Age social complexity by putting them within the general context of the fast-advancing new research on this period, with a particular focus on the mega-site of Valencina de la Concepción (Sevilla).

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08 THE ORIGINS OF SOCIAL INEQUALITY IN PREHISTORIC EUROPE: RITUALS AND MONUMENTS TO CONTROL WEALTH IN BRONZE AGE OF LA MANCHA

Author(s): Benítez de Lugo Enrich, Luis (Department of Prehistory and Archaeology. Universidad Autónoma de Madrid; Department of Prehistory and Archaeology. Universidad Nacional de Educación a Distancia) - Mejías Moreno, Miguel (Instituto Geológico y Minero de España) - Esteban, César (Instituto de Astrofísica de Canarias; Department of Sciences. Universidad de la Laguna) - López Sáez, José Antonio (Instituto de Historia. Consejo Superior de Investigaciones Científicas)

Presentation Format: Oral

The impact of the studies of Professor A. Gilman and his team, developed since the eighties on the motilla of El Acequión and the settlement of Eastern La Mancha, has served to construct explanations that today allow us to interpret the landscape and society of La Mancha (Spain) during the recent Prehistory. His work has allowed us to advance in the knowledge about the role that the control of territory, water and capital played throughout the process of the emergence of social inequality in prehistoric Europe.

On this basis, recent contributions from the fields of Paleohydrogeology, Paleoecology and Archaeoastronomy inform about the solutions that the Chalcolithic communities had to adopt with the arrival of the environmental crisis caused by the Climate Event 4.2 cal ka BP. The stress generated required a group response. The resilient society of the Bronze Age of La Mancha sought groundwater to create a regional network of large supply wells, for the first time in Europe. In order to control and protect their resources they used as arguments the monumentalization of the landscape, a solar cult and the legitimation that provide the rite to the ancestors. Complex ceremonial centers with burial mounds and sun-oriented corridors were built on strategic locations and were used for a millennium and a half, as is the case of Castillejo del Bonete (Terrinches, Ciudad Real). Motillas were erected around the wells, which protected -physically and symbolically- the resources that guaranteed the survival of the community.

This work presents the current state of knowledge about the Bronze Age of La Mancha; an exceptional culture that Professor A. Gilman helped define.

09 METAL PRODUCTION IN EL ARGAR CULTURE: RECYCLING AND METAL CONSUMPTION

Author(s): Montero Ruiz, Ignacio (Instituto de Historia-CSIC) - Rovira Llorens, Salvador (Museo Arqueológico Nacional) - Murillo-Barroso, Mercedes (Universidad de Granada)

Presentation Format: Oral

One of the main and differentiated characteristic of metals with respect to other raw materials in Prehistory is their recycling capacity. Old or broken pieces and casting failures can be reused easily by melting down. This action has an impact on the archaeological record and must be taken into account in the quantitative production estimates. But the intensity of recycling depends on the economic necessities of a society.

The economic and social impact of metallurgy in El Argar culture is a controversial topic with opposite interpretation. Some scholars argument at the same time that access to metallurgy seems to have been restricted to certain settlements and social groups, with a centralized production and distribution of metal, and suggest a high scale of production and consumption. The argument of an intensive recycling activity could explain the suggested "invisibility" of this metallurgical production, contrary to those who support a less intensive scale of production and reject the centralized scheme.

An indicator of the importance of the production and use of metal is the length of its useful life i.e. the frequency with which tools, ornaments and weapons are replaced. The quicker their replacement because of wear, accidental loss or voluntary disposal, the bigger the volume of production that was necessary. We explore this argument measuring the length of use of daggers through their dimension and the signs of re-sharpening.

The elemental composition and the variation in arsenic mean values in different types of objects due to the volatility of arsenic during melting could also help to calibrate the impact of recycling in the El Argar metal production. Finally, the lead isotope analysis of copper and bronze objects let detect patterns of recycled metal.

These approaches suggest that metal recycling was not a main practice in metal production in El Argar.

10 PROJECT AU: THE ARCHAEOLOGY OF GOLD

Author(s): Perea, Alicia (CSIC)

Presentation Format: Oral

Not all material evidence had the same fate in archaeological research over time. Concerning metallurgy this has occurred with slags, unidentified as a significative metallurgical leftover till not long ago (Bachman 1982). At the other end of the argument is gold, always a prestigious find but a leftover for researchers, more typical of art historians than of archaeologists. Few farsightedly people turned to technology as the only way out (Lechtman 1984) although archaeometry was at its inception. To make things worse, the concept of technology then in use had not yet taken distance from the technocratic actualism of post industrial thought.

Project Au was implemented two decades ago with the aim of changing this state of affairs, especially considering that the Iberian

peninsula is an extraordinarily rich area in archaeological gold finds of all times. It was necessary to redefine concepts, tune up methodologies and think up an adequate theoretical framework that would allow us to fit gold in the archaeological discourse with its own ontologies (Perea 2014). This was not done without the concurrence of very different experiences and contributions, from the Anthropology (Dobres 2000) to the Economy and Politics (Anisi 1992).

My contribution to this session in honour of Professor Gilman will wander around gold metallurgy, power relations and technological transfer in Iberian pre- and proto-history. In this I will follow his track, the permanent questioning of the archaeological evidence and its explanation.

11 REVISITING GERMANIC SOCIETIES IN LATER PREHISTORIC IBERIA

Author(s): Blanco-González, Antonio (Universidad de Salamanca)

Presentation Format: Oral

Most communities in later prehistoric Europe feature ambiguous diagnostic traits and may fit an array of nonstate societal models. This contribution draws on the intellectual foundations put forward by Antonio Gilman to scrutinize several such societies in archaeological terms. The paper focuses on examples from later prehistoric Iberia which underwent the weakening of the typical features of rural agrarian and kinship-based societies: moral economic strategies leaning to social cohesion, which favoured egalitarianism and impeded the exhibition of social inequality. During the second and first millennia BC these social mechanisms gave way to conflict between corporate groups. Thus, lineages and clans competed between them for agrarian resources (land and chattel), showed off differences in agrarian success, and committed themselves to enlarge and pass their social and economic capital on to their progeny. In particular, this presentation focuses on petty territorial polities lacking centralization, with households whose pervasive isonomic ethos resisted against stratification. These communities exhibited failures and ephemeral outbreaks diverging from progressive social processes from tribal to tributary organizations. Rather than appraising their social trajectories as unsuccessful or drawback, this paper aims to demonstrate that the rich variability in the archaeological record can be tackled from more flexible concepts, using a bottom up reasoning. Thus, such cases can benefit from their assessment as Germanic societies, a model that may convey the historic idiosyncrasy of the Mediterranean social world while circumventing mainstream teleological and managerial standpoints.

12 THE TAULAS OF MINORCA AND ITS IDEOLOGICAL FUNCTION DURING THE POSTALAYOTIC PERIOD

Author(s): Prados Torreira, Lourdes (Universidad Autonoma de Madrid, Departamento de Prehistoria y Arqueología)

Presentation Format: Oral

The Postalayótic period of Minorca (Spain) has traditionally been dated between 550 - 123 B.C; year of the Roman conquest of the island. One of the characteristics of this period, that is usually considered as change indicator, is the gradual disappearance of the "talaiots" from the middle of the 7th century B.C. This process seems to be consolidated during the 5th century B.C., with an internal reorganization and control of the territory by the main settlements, while many of them are fortified.

This changes are also reflected with the commercial development and with the arrival of the first imported goods on the island during the 6th century B.C., as a result of the inclusion of Minorca in the Punic trade circuits of the central and western Mediterranean, especially from Ibiza.

This contact with Mediterranean external circuits will also be reflected in the religious beliefs of the island. In the same way, the funerary rites of the previous period will continue, such as collective burials, now with a greater differentiation of wealth in the grave goods, as indicator that social inequality is consolidating.

With this paper I would like to present the religious aspects of this period focused in the well-known sanctuaries known as Taula precincts. These religious spaces will allow the villages, to reinforce their political, economic, and ideological sense of belonging to the community, through the celebration of certain festivities and with the regulation of their characteristics rituals

13 SUBMISSION VERSUS REBELLION COSTS: WHY THERE ARE NO SOCIAL HIERARCHIES IN IBERIAN NORTHWESTERN IRON AGE UNTIL ROMAN RULE

Author(s): Sastre, Inés (IH.CSIC) - Sánchez-Palencia, Francisco Javier (IH.CSIC) - Currás, Brais (Universidade de Coimbra) - Orejas, Almudena (IH.CSIC)

Presentation Format: Oral

More than 20 years of research, from the landscape studies of Fernández-Posse and Sánchez-Palencia in León Iron Age castros, have allowed us to trace a historical trajectory of agrarian communities of Northwestern Iberia from segmentary castros during the Iron Age to tributary peasants under Roman rule. The important contributions of Antonio Gilman, which have been very inspiring for our interpretations –especially those related to Iron Age–, help us to define the interweaving of agrarian communities in social relations of production: the conflictive orientation to explain the social stratification overcoming functionalism and the emphasis on the link between owners and producers as the hidden basis of all social formation; the spatial and archaeobiological approaches to define the productive foundations of societies; the emphasis on the capacity for action of the peasant groups (without "managers"), to intensify the productive system and/ or to activate community organizations that mitigate inequalities.

Gilman has dismantled the arguments that were considered "obvious" for the existence of social stratification in archaeological

records, such as those of the peninsular Southeast, which actually were much more ambiguous than it seemed. This brought to light a very relevant problem: the over-interpretation of social hierarchy during the Prehistory and Protohistory, promoted mainly by those approaches committed to the “unmasking” of social exploitation of the lower classes. It is what Gilman himself calls, paraphrasing Yoffee “complexity inflation”, understanding “complexity” as equivalent to “centralized societies”. The emphasis on exploitation sent interest in the segmentary/ communal strategies of social organization to the background.

On this basis we will try to show how in Northwestern Iberia Iron Age we are facing egalitarian societies based on social segments capable of replicating and dividing without restrictions. And subsequently under Roman dominion a tributary system based on peasant exploitation was put in place.

14 POLITICAL RESISTANCE, BODY AND MATERIAL CULTURE. THE CASES OF THE AWÁ (BRAZIL) AND THE GUMUZ AND DATS'IN (ETHIOPIA)

Author(s): Hernando, Almudena (Universidad Complutense, Madrid)

Presentation Format: Oral

The evolutionist convictions that tend to permeate history have sometimes prevented an appraisal of the complexity which characterizes most historical processes. Accounts about prehistory tend to follow a linear trajectory which, quite astutely, describes the origin and progression of those very traits which characterize contemporary society: increased power, conflicts, arms and fortifications; the accumulation of surplus and its implications for social hierarchization, the emergence of individualizing features and their association with wealth; increasingly sophisticated technology and its links with farming, cattle rearing, metallurgy and trade, etc., etc. Historical accounts, always constructed from the present, have chosen not to regard all those other dynamics which, - seen as inappropriate from neoliberal ideals - contemporary society does not acknowledge as its own. Such dynamics are connected to the need to sustain the common, to establish bonds or keep traditions, and to counter the destabilization that is always associated with change. In fact, such dynamics exist in all societies (as anthropology has been trying to prove ever since Clastres) and should therefore be identifiable in the archaeological record. This presentation analyses the dynamics of resistance of three present-day groups among which ethnoarchaeological work has been carried out, - the Awa in Brazil, on one hand, and the Gum'uz and Dats'in in Ethiopia, on the other- to interpret certain expressions relating to the body, to space and to material culture as resistance. Also, to analyze their close connection with the gender dynamics such expressions are associated with.

15 THE MIDDLE PALEOLITHIC REVOLUTION

Author(s): Zilhao, Joao (Univ de Barcelona, Fac de Geografia i Historia)

Presentation Format: Oral

In a long-term perspective, the Middle-to-Upper Paleolithic transition represents a watershed in human history. By the later Upper Paleolithic, around 25,000 years ago, all continents were occupied, all types of world ecosystems were exploited, and all aspects of ethnographically observed hunter-gatherer culture the archaeological record is able to preserve are indeed found therein. Prior to 100,000 years ago, such is unquestionably not the case. There is therefore little reason to question the notion that, in a geological or evolutionary time scale, that transition is a “revolution” in the sense of Antonio Gilman's (1984) “Upper Paleolithic Revolution:” a protracted process of technological improvement and demographic growth, combined in a feedback loop with developments towards more sophisticated modes of communication and social organization. But is this process an “Upper Paleolithic” one? We now know that formal burial is documented as early as ~120,000 years ago, and that its emergence is broadly coincident with that of body painting, personal ornamentation, and object decoration, forming a package that is more amenable to social- or demography-based explanations than to cognitive- or human taxonomy-based ones — as otherwise implied by the fact that, in Europe, the beginnings of cave art date back to beyond 65,000 years ago, which implies Neanderthal authorship. Given that the association of formal burial with residential localities is strongly suggestive of formalized territoriality (i.e., of ethnicity and ethnic boundedness) it would seem that — except for the colonization of Australia and the Americas — all of Gilman's Upper Paleolithic revolution components were already in place during the Middle Paleolithic. This does not necessarily counter Gilman's model. His reasoning remains entirely valid, and so does his model once updated in light of knowledge that we now have and, at the time he formulated it, did not exist yet.

16 A SPECTRE IS HAUNTING EUROPE... THE IMPACT OF ARCHAEOGENETICS AS SEEN FROM IBERIA

Author(s): Vicent García, Juan - Martínez Navarrete, Isabel (Instituto de Historia CSIC)

Presentation Format: Oral

Recent developments of aDNA studies have had a powerful impact on European Prehistoric Archeology, both on practical and theoretical levels. One of its most perceptible effects has been the implicit -and in some cases explicit- rehabilitation of Gustav Kossinna's thought, a trend with ideological and political implications that should not be set aside. Beyond the need for a theoretical rearmament against what could be the foundations for a renovated scientific justification of new forms of racism, we must commit to an inquiry on the ways in which Archaeologists and Geneticist interact, situating what is undoubtedly a powerful scientific tool in the context of a critical archaeological practice, one committed to emancipatory values.

Following this line of thought, we review the Neolithization of Iberia as a paradigmatic case study. The long-lasting prevalence of interpretations based on the existence of a demic diffusion of some kind or another, grants any genetic data an unavoidable and

crucial role in the theoretical debate, very specifically in relation to the discontinuities in genetic patterns between Mesolithic and Early Neolithic populations, and the putative Near Eastern connections of the earliest Neolithic groups. In this contribution we will examine the ways in which Archaeologists are interpreting the growing genetic evidence when building their historical narratives. Vice versa, we will take into account the ways in which Geneticists use the information provided by Archaeologists in order to historically organize their paleo-genetic record.

17 THE RESEARCH OF POLITICAL ORGANISATION IN ARCHAEOLOGY

Author(s): Micó, Rafael - Lull, Vicente - Rihuete-Herrada, Cristina - Risch, Roberto (Universitat Autònoma de Barcelona)

Presentation Format: Oral

Politics and political organisation are major issues in contemporary archaeology. Claims that the political standpoints held by archaeologists continuously shape topics and areas of interest and also the competing discourses addressed to 'rule' over the 'state of the art', are a main concern in the academic domain. Nevertheless, leaving aside this always controversial point we will focus on how political relations in past communities are inferred and how these inferences are linked in the archaeological reasoning. For much of processual and postprocessual archaeologies, political categories such as 'power', 'prestige', 'hegemony' or 'identity' are usually invoked: either by diagnosing a sociopolitical type in the sequence from bands to civilisation or by guessing which dimension of heterarchy or transegalitarianism was under way, the core of the social past is usually understood and named with political terms. In sum, politics and political organisation seems to be 'all around' in archaeology, past and present.

Our goal is to challenge the priority given to political categories in archaeological research. From a Marxist approach, politics are a particular realm involved in the production of social life. Political relationships (or their effects) could be found everywhere, but their exclusive realm lies in the distribution momentum as a part of the cycle of general production defined by K. Marx. In this sense, politics are connected with the key concept of 'property'. Political moves and decisions are not the leading core of social relationships, but the knowledge of a given society must take politics into account. We will discuss how the means of production of political relationships (dialogue or violence) take place in society and which are the main problems and prospects to be empirically detected by the archaeological research. A certain means offer insights on the ways (agreement or coercion) through political relationships are performed and maintained.

18 MODES OF PRODUCTION AND THE EUROPEAN BRONZE AGE

Author(s): Kristiansen, Kristian (University of Gothenburg) - Earle, Timothy (Northwestern University)

Presentation Format: Oral

In archaeology, we have recently witnessed a return to materialist theories. Here we wish to situate this trend in historical perspective, including the important contribution of Antonio Gilman to a Marxist archaeology. Most political economy theories emphasize rising population densities as creating conditions of control over subsistence production and specialization, but archaeological research in Europe, Central Asia, the Pacific, Africa, and the Americas document the emergence of social stratification and political control under conditions of much lower population density than expected. For Europe, Gilman has reconsidered the applicability of the Germanic Mode of Production, a political economy strategy based on farmstead ownership of land and institutional decentralization similar to segmentary tribes in pastoral societies. We argue that the development of extensive exchange and raiding in Bronze Age Europe formed a Maritime Mode of Production with conditions of control that make understandable the observed large-scale economic transformations at quite low population density as observed for the Bronze Age.

We thus proposes to combine elements of the Germanic Mode of Production into the Maritime Mode of Production. Finally, we shall discuss how modes of production and reproduction can be contextualised within a World System approach. As the Bronze Age represents the first globalisation in World History it makes the application of a WS approach relevant, even in modified form.

19 STUDYING DEVELOPMENT OF INEQUALITY IN VIKING AGE ICELAND - THE COERCIVE POWER OF ANTONIO GILMAN

Author(s): Steinberg, John (UMass Boston)

Presentation Format: Oral

In 1995 Antonio Gilman suggests that in Viking Age Iceland "stratification emerged without any redistributive function being carried out by those who become more equal than others." A description like that could only have come out of Gilman's deep understanding of the evolutionary Marxist anthropological problem. This statement brought me to Iceland in 1998 and has driven our work on the Norse settlement sequence of this prehistorically uninhabited North Atlantic island. In our first settlement pattern study, conducted in the Langholt region of Skagafjörður in North Iceland, we found that early farmsteads were remarkably similar in content but variable in size. This finding is consistent with Gilman's interpretation that households in this transplanted "Germanic society" maintain their self-sufficiency. The data also suggests that during the early phases of the settlement, the farmsteads were generally large and remarkably equal. Towards the end of the Viking Age settlement, ever smaller households appeared, probably subdividing what were initially large land claims. The results hint that there were substantial advantages to being better connected to the first people into this sub-arctic landscape. The advantages to being first, evidenced in the archaeological record, may either be a cause or a consequence of the advantages of legal and military leadership, described in the written record of the Icelandic family sagas.

Either way, the results suggest that incipient hierarchies in Viking Age Iceland were not based on any type of redistribution, but on the coercive powers, potentially granted to the earliest settlers, simply by their being first.

20 WHY ARCHAEOLOGICAL SURVEY? FROM THE COMPLEXITY OF SURFACE RECORD TOWARDS AN AGRARIAN HISTORY OF LANDSCAPES

Author(s): Mayoral Herrera, Victorino (Merida Institute of Archaeology, Spanish Council of Research)

Presentation Format: Oral

In recent years, we have witnessed a consolidation of the fusion between (increasingly democratized) geospatial technologies, and the implementation of standardized methods of archaeological survey. Frequently, this development has introduced us into a spiral of methodological refinement and technological sophistication. In addition, the intensive nature of this type of work has tended to miniaturize the spatial scale, moving from a regional analysis to the study of micro-areas. Due to all this, it is possible that we have often lost sight of the great picture of the landscape, moving away from a reflection on the primary motivations of this type of work. In this presentation, we propose to emphasize the connections between the systematic recording of a wide spectrum of manifestations of human activity, and the need to articulate a discourse on the agrarian history of the landscape solidly grounded on a theoretical paradigm. We also want to raise the urgent need for this work to have a real impact in the present and future of agricultural spaces. From the point of view of the mere survival of the material evidence, it is imperative to undertake its recording in large areas that are undergoing an accelerated and radical process of transformation. We propose in this sense the opportunity that represents that also the agents interested in the exploitation of the land are using methods of analysis and management with great affinities with those used by Archeology. At the same time, the temporal depth of our approach to the landscape can, and should be, a benefit in the processes of appropriation and social revaluation of the rural environment by the communities that live in it.

21 AGRICULTURE, COMMUNITIES AND THE LANDSCAPE IN THE PREHISPANIC PERIOD IN THE HIGHLANDS OF THE ATACAMA DESERT (RIO SALADO, NORTHERN CHILE)

Author(s): Parcero-Oubiña, César (Instituto de Ciencias del Patrimonio, Consejo Superior de Investigaciones Científicas) - Troncoso, Andrés - Salazar, Diego (Departamento de Antropología, Universidad de Chile) - Hayashida, Frances (Department of Anthropology, University of New Mexico) - Fábrega-Álvarez, Pastor (Instituto de Ciencias del Patrimonio, Consejo Superior de Investigaciones Científicas) - Borie, César (Programa de Doctorado, Universidad de Tarapacá-Universidad Católica del Norte) - Pino, Mariela (Freelance archaeologist)

Presentation Format: Oral

The Atacama Desert, allegedly the driest place on earth, has been historically an area with a very low density of human settlement, basically due to the extreme environmental conditions (aridity, altitude). Despite that, human communities, both in the past and in the present, have been able to settle and live there, and to develop surprisingly (for us) complex and efficient productive systems based on irrigated agriculture. The Late Intermediate Period (ca. 900-1400 d.C.) witnessed the development of complex social systems based on the aggregation of population in enclosed settlements and the construction of large compounds of irrigated cultivation terraces. The area was later conquered by the Inkas and became part of the Tawantinsuyu. Inka conquest has been traditionally considered military in nature and driven by an economic purpose, although those ideas are being re-assessed today.

In this paper we will explore some questions related to that archaeological context, drawing from the work we have been developing in the last 7 years in the sites of Topain, Paniri and Turi, in the area of the Salado River. We will combine the archaeological data collected and the rich ethnographic information available in the area to discuss some issues about the possible forms of production and social life in the prehispanic period in that area.

22 PRELIMINARY SPATIAL AND CHRONOLOGICAL ANALYSIS OF PREHISTORIC SITES IN TAIWAN: TOWARDS SOCIAL COMPLEXITY

Author(s): Cruz Berrocal, María (IIIIPC, Universidad de Cantabria) - Sebastián López, María (Universidad de Zaragoza) - Serrano Herrero, Elena (IIIIPC, Universidad de Cantabria) - Tsang, Chenghwa (University of Tsing Hua) - Uriarte González, Antonio (CSIC)

Presentation Format: Oral

The prehistoric archaeology of Taiwan is a topic of interest in itself and also in relation with the study of human colonization -the settlement of Taiwan itself, as well as relevant debates in Pacific archaeology, most prominently the "in- and out- of Taiwan" dispute for the explanation of the Austronesian expansion. In the last 15 years the archaeological knowledge about Taiwan has grown exponentially due to CRM excavations on the whole country by universities, research institutions, museums, and at a lesser scale private companies. Excavations and surveys throughout the island have produced a large number of new archaeological sites comprising the whole historical sequence of occupation of Taiwan, and a wealth of published and grey literature, mostly in Chinese. A basic geographic approach to all of this newly produced knowledge was conveyed in 2001 by a GIS created by the Academia Sinica and the Ministry of Science Council for Cultural Affairs of Taiwan. In 2013-2016 we compiled a database of 1285 sites distributed throughout Taiwan conveying a very basic corpora of information: coordinates, municipality, chronology and basic description of materials and findings.

In this study, we aim to produce a multiproxy dataset for the geocontextualization through GIS of the sites in combination with the

archaeological information: chronology and characterization. Our goal is to visualize the data and to construct a broad, large scale, diachronic narrative to start to shed some light on the general distribution of the sites throughout the island. Ideally, different patterns will emerge from our analysis. This kind of study has become a “staple” of archaeological work in the last decades. Antonio Gilman pioneered this kind of approach contextualizing geographically the archaeological sites in order to draw historical explanations. His work has been a reference in our previous and current work.

23 ANTONIO GILMAN AND SOUTH AMERICAN ARCHAEOLOGY

Author(s): Costin, Cathy (Department of Anthropology California State University Northridge)

Presentation Format: Oral

While Antonio Gilman has made a clear and direct contribution to a wide range of topics in European archaeology – as is so clearly illustrated by the other contributions to this session -- his presence and impact in South American archaeology at first glance appears to be more oblique. A review of the literature reveals that rather than directly impacting research in South America, Gilman's influence has come more from the way his work inspired and guided a small community of colleagues, who built on his ideas and then inspired larger conversations among archaeologists and prehistorians working in South America with interests in the advent of power differentials, social inequality and concomitant changes in economic organization. In this paper, I trace how Antonio Gilman's work on the rise of social stratification, the organization of the economy, the emergence of powerful leaders, and his Marxian perspective more generally influenced archaeological conversations in the Andean region and beyond. I conclude with a brief discussion of the ways in which Gilman's work has influenced me over the years, including my own work on the rise of social inequality in the Andean Formative period and on social landscapes of craft production during the Inka empire..

082 ISLAMICATE ARCHEOLOGY IN EUROPE: PAST, PRESENT AND FUTURE

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Govantes Edwards, David (Instituto de Estudos Medievais, Universidade Nova de Lisboa; Universidad de Cordoba) - Duckworth, Chloe (Newcastle University) - Koval, Vladimir (Russian Academy of Sciences)

Format: Regular session

The archaeology of Islamic societies and groups has often had an awkward fit in European archaeological narratives, despite the presence of Islamic culture being a significant, sometimes dominant, factor for many European societies from the early medieval period on. Following the Session 'Islamic Archaeology in Europe' (EAA Annual Meeting Maastricht 2017), this session aims to engage with different approaches to the European Islamicate past and its contemporary political and heritage-related implications, while examining its relationship with European archaeology in general. We argue that Islamicate archaeology needs to be incorporated into the mainstream of European archaeological discussion, instead of being, as has often been the case, a niche sub-discipline which discusses societies that are categorically perceived as 'other'. The session will welcome papers that discuss the theoretical implications of Islamicate archaeology, including terminological, historiographical and contemporary political considerations; case studies that examine how to imbricate the study of specific Islamicate cultural horizons in the European continent with that of non-Islamicate societies; and, case studies on specific material traces (e.g. material culture, technological practices, urbanism) in particular periods and regions, or diachronically/inter-regional, and their relationship with other strands of European archaeology. Needless to say, the session is open to contributions from all of Europe and every theoretical persuasion, as the ultimate purpose is to trigger a wider debate on the role of Islamicate archaeology within the framework of European archaeology and cultural heritage.

ABSTRACTS

01 WHAT IS THE FUTURE OF ISLAMICATE ARCHAEOLOGY IN EUROPE?

Author(s): Govantes Edwards, David (Universidad de Cordoba; Universidade Nova de Lisboa) - Duckworth, Chloe (Newcastle University)

Presentation Format: Oral

Over the past few decades, traditional narratives of European history and archaeology have been called into question, and the elegant evolutionary picture of European civilisation, that few would have challenged fifty years ago, is progressively being replaced by a more complex and nuanced approach to the past. Yet there remain significant gaps in the story. The presence of Muslim-ruled societies in the European continent is often seen as an uncomfortable parenthesis; an interruption of the 'natural' historical development of the regions in which it has occurred. Even if not couched in such explicitly evolutionary terms, the presence of Islamicate culture – including material culture – in Europe is often approached from a perspective that distinctly (but not necessarily consciously, or explicitly) emphasises its 'otherness', turning the study of Islamicate archaeology into a niche academic field that rarely interacts with the mainstream. The time is ripe for a reassessment of the role played by Islamicate societies in European history, and archaeology must assume a leading part in this process. We recognise the diversity of Islamicate cultural heritage in Europe, not least in the way it is studied and its varying relationships (or perceived relationships) to contemporary societies, but there are significant points of intersection between the different archaeologies, not least that we face similar challenges of addressing difficult narratives. In

this introductory paper, we ask: what is the future of Islamicate archaeology in Europe, and what should our role be in shaping this?

02 FROM TRANSITION TO MIGRATION: FOR A THEORETICAL PERSPECTIVE THAT EMBRACES THE CONTRIBUTION OF IMMIGRANTS TO THE EMERGENCE OF AL-ANDALUS

Author(s): Carvajal Lopez, Jose (University of Leicester)

Presentation Format: Oral

The Islamic conquest of al-Andalus was followed by the migration of Muslim groups to Iberia, as the archaeological record clearly shows. While numbers are not known, very few people would claim that the impact of the migration was unimportant. However, current theoretical views on the formation of al-Andalus often pay little attention to this migration process. This might be in part due to the fear of falling into the misuse of migration as a “black box” to explain cultural change, but I will argue that it is in part also due to constraints placed by the theoretical and methodological perspectives that have been used over the last forty years. Recent theoretical views on migration from an archaeological point of view suggest that the analysis of the mechanics involved in the process can contribute to a better understanding of social and cultural change. Therefore, scholars dealing with al-Andalus should make migration part of the archaeological question, rather than referring to it as the cause of change. In the last part of the paper, I will discuss how discussions of cultural change that take into consideration migration and material culture (especially ceramics) can contribute to re-addressing the issue of the formation of al-Andalus.

03 FROM FUNDUQ TO ALHÓNDIGA AND FONDACO: TOWARDS GLOBAL MIDDLE AGES

Author(s): Hernández Robles, Alicia (University of Murcia)

Presentation Format: Oral

The institution of the funduq is generally understood as an inn and warehouse for merchants and travellers of all religions and geographical origins. The funduq is Arab-Islamic in origin and emerged in the context of a Mediterranean Sea under Islamic rule, based on an east-west axis of communication. However, the interest of the funduq not only relies on its permanence in Islamic territories throughout the Middle Ages, but also to the adoption of this building in a wide range of medieval geographical contexts. European adaptations of this institution (fondaco, alhóndiga or fondach), from the 13th century onwards, when the commercial control of the Mediterranean passed into Christian hands, shows how this architectural feature survived in spite of social and cultural changes. Therefore, the archaeological study of the funduq is an example of the materialization of commercial dynamics in the Medieval Mediterranean, and also provides a better understanding of the relationships that existed between various social and religious groups in urban contexts, as well as between the different Mediterranean religious and political groups. This paper intends to provide a global and interdisciplinary analysis of the funduq, taking al-Andalus as a case study and combining both archaeological and written sources. My aim is to characterize the elements that constituted this institution and its operation in order to show illustrate their survival and transformation, especially after its adoption by non-Islamic societies. The archaeological study of the funduq opens a reflection on what should be understood by Islamic archaeology. After all, this institution can be studied within both Islamic and European archaeological frameworks. Should we think, from a medieval global perspective, that the archaeology of both geographical contexts is as entangled as the various medieval polities on both shores of the Mediterranean were?

04 SUBURBAN MEDIEVAL LANDSCAPES IN GRANADA, THE LAST ISLAMIC CITY IN SOUTHWESTERN EUROPE

Author(s): Garcia-Contreras Ruiz, Guillermo - Malpica Cuello, Antonio (Universidad de Granada)

Presentation Format: Oral

Granada was the capital of the Nasrid Kingdom, the last Islamic emirate in the Iberian Peninsula, between the 13th and the 15th centuries. In the late Middle Ages, this town grew and changed its appearance due to the arrival of population groups from other parts of the Peninsula and the political, economic and environmental processes that affected the management of its hinterland. According to the written sources, the outskirts of the city were a very productive area, spotted with newly-built farms and almunias. Due to the urban growth during the final years of the kingdom, a considerable amount of archaeological remains has been discovered. Based on this evidence, along with other sources of information, our aim is to illustrate the medieval landscape in the outskirts of Granada, and its transformation in the aftermath of the Castilian conquest of 1492 and the subsequent process of Christian colonization. We shall largely focus on the northern part of the modern city, an area known in the Middle Ages as “Cármenes de Aynadamar”, which was described as being strewn with rich houses, farms, and vineyards. The area was also traversed by one of the most important water courses of Granada: the ditch of Aynadamar. After Granada was conquered in 1492, this land was given to the Carthusian order for the construction of a monastery. After this, the Carthusian order transformed the landscape, replacing the previous Muslim owners, changing the production system, sowing dry crops in terraces and walling all estates. Currently, this area houses part of the university campus of Granada. In addition to the historical aspects mentioned above, this paper claims that there is a need to integrate the Islamic remains into the protected heritage of Granada, because they are just as important as the old Islamic town and the famous palatine city of the Alhambra.

05 DE-ORIENTALISING GENDER: (EN)GENDERING AN ARCHAEOLOGY OF ISLAMICATE SOCIETIES BEYOND ISLAM

Author(s): Herran Subinas, Mikel (UCL Qatar)

Presentation Format: Oral

Women and their position within Islamicate societies have long been a matter of a debate, particularly in the frame of (neo)colonialist and postcolonialist discourses. This debate has also taken a historical perspective, but rarely has gender in Islamicate societies been discussed in archaeological terms. In fact, women are frequently absent from the archaeological record and its interpretation. Where, then, should we look for them? And how should we look for them without creating exoticised images of 'Other' women long denounced by Said (1967). Though politically charged, the subject of gender in society cannot be avoided. Gender archaeology in Islamicate societies needs to be not the search for past Muslim women, but the study, in archaeological terms, of systems of signification in relation to gender, of which Islam is but one. Also, it is one subject to constant redefinitions and (re)interpretations. Other signifiers that affect (and are affected by) gender performance include tribe and tribal honour, socioeconomic status, ethnicity, sexual behaviour or coexistence with populations of different socioreligious backgrounds. Understanding these systems and how they imbricate and create hegemonies of masculinities and femininities in Islamicate societies is not only insightful on its own terms, but it is one key step into breaking down the long-held Western fascination with the Muslim 'Other'.

06 ARCHEOLOGY AND ISLAMICATE SOCIAL FORMATION. M. ACIÉN'S THEORETICAL MODEL

Author(s): Salvatierra, Vicente - Montilla, Irene (Universidad de Jaén)

Presentation Format: Oral

M. Acién (1950-2013) is an essential author for the analysis of the society of "Islamic" regions in general and of Al-Andalus in particular. What he called "formación social islámica" might be translated into "islamicate social formation", adopting the term "islamicate" coined by Marshall Hodgson. This term seems to have arrived in Spain as a result of the conference that vindicated his figure in 2014, and its popularisation might be related to the need to separate the historical process undergone by the territories where the Islamic religion is followed by the majority of the population from the religion itself, given the "contamination" resulting from the misuse of these terms. Naturally, the thought of M. Acién is radically different from M. Hodgson's. M. Acién took into consideration archaeological and written sources (Latin, Castilian and Arabic) in order to reinterpret the history and society of Al-Andalus. His main contribution was to treat "social islamization" and Islamic religion as two fundamentally different issues. His thought is organized around the concept of social formation in Islamic societies: "[Islamic society] was a specific society (...) probably with its own and exclusive characteristics, [within the framework of] tributary societies (as defined by Samir Amin). This specific social formation can be defined by the "hegemony of the private at an abstract level and the prevalence of the urban at a concrete level", while the religion "is just another element that participates in the internal logic of the ideology that defines this formation" without determining anything by itself. In this presentation we shall review the archaeological record and how it relates to this theoretical construction.

07 PARTIAL ARCHAEOLOGIES: THE PALATIAL CITIES OF MADINAT AL-ZAHRA AND THE ALHAMBRA

Author(s): Govantes Edwards, David (Universidad de Cordoba; Universidade Nova de Lisboa)

Presentation Format: Oral

Since the beginning of archaeological practice in Spain, Islamicate archaeology has been sliced into two by an existential divide. While the aesthetic aspects of the Islamicate heritage of al-Andalus have been easily embraced by academics and the general public, the insertion of its Muslim past into the historical narrative of Spain has been a good deal more problematic. Often, especially in those cases in which the period of Muslim rule is harder to ignore, the problem has not necessarily been one of open rejection, but of neglect. In this paper, I use the examples posed by the palatial cities of Madinat al-Zahra (Córdoba) and the Alhambra (Granada), to emphasise the preponderant research focus on those subjects which reinforce contemporary aesthetic perceptions of al-Andalus, while contributing little, if anything at all, to increase our knowledge about other aspects of Andalusí society, which have frequently been summarily dealt with by invoking borrowed, and not necessarily correct, general models. As such, I shall make a brief review of the history of archaeological research at both of these sites. In the case of Madinat al-Zahra, numerous publications have speculated about the structure and distribution of the urban elements within the medina, but this has been based on limited, and sometimes arguably irrelevant written sources, while substantial financial and intellectual efforts have been spent on the reconstruction and the restoration of the palace. In the Alhambra, the area of the medina has been to a large extent cleared of archaeological remains, following a visitor-oriented philosophy which has laid all stress on the palaces; to make the situation even worse, more often than not, this obliteration of the archaeological record has not followed the most basic of archaeological protocols.

08 ORIGIN AND SYMBOLISM OF THE CALIPH'S TIN-GLAZED WARE IN MEDIEVAL MUSLIM SPAIN, IN THE LIGHT OF THE ARCHAEOLOGICAL RESULTS

Author(s): Salinas, Elena (Universitat Politècnica de Catalunya)

Presentation Format: Oral

The earliest discovery of tin-opacified glazed ceramics, known as "verde y manganoso" ("vert et brun" or "green and brown"), in Madinat Ilbira (1888) and Madinat al-Zahra (1912), two of the most prosperous settlements of medieval Muslim Spain during the 10th

century, took place over a century ago. Soon afterwards, and owing to the large number of specimens found in the archaeological excavations of Madinat al-Zahra, they became associated with the Caliph Abd al-Rahman III and his palatial city, which was the capital of the Umayyad Caliphate in al-Andalus. Traditionally, the earliest production of this tin-glazed ware has been dated to the 940s and 950s, in relation to the construction and zenith of Madinat al-Zahra. Connections have been established with the North African ceramics of Ifriqiya during the reign of the Aghlabid and the Fatimid dynasties. The colours and decorative themes used in these wares have been regarded as political and religious symbols. In the light of new archaeometric studies and well-contextualised finds of "verde y manganoso" ceramic wares, a revision of these generally accepted theories about the Caliph's tin glaze ware is proposed, and a review of the historiography of 10th-century Andalusian material culture, its colours, symbols, decorative patterns, provenance, influence and technology, is presented.

09 MADINAT MANURQA: ISLAMIC MEDIEVAL ARCHAEOLOGY IN THE BALEARIC ISLAND OF MENORCA, SPAIN. IS IT STILL CONDEMNED TO DAMNATIO MEMORIAE?

Author(s): Perez-Juez, Amalia (Boston University; Institut Menorquí d'Estudis) - Sintés, Elena (Institut Menorquí d'Estudis)

Presentation Format: Oral

The Muslim occupation of Menorca lasted approximately four centuries and had a deep, if little known, impact on the island. Muslim heritage may be found in material culture, artifacts and sites, as well as in surviving modern toponyms. The landscape was also heavily transformed, not only by the reoccupation of prehistoric sites but also the cultivation of new lands and the introduction of new agricultural crops. The imprint of these centuries is still very much present on the island, but has attracted little archaeological or historical attention. Only in the past couple of decades has there been some interest in the medieval Andalusian past of Menorca. Scattered teams have investigated irrigation systems, land cultivation, domestic spaces and necropoli. In this presentation we will share some recent findings related to Medieval Islamic Menorca. Archaeological excavation has yielded substantial evidence, and a new picture of the almost four centuries of Arab influence can now be drawn, after being totally erased from the local historical consciousness. We certainly need archaeology to bring this history to light, and to write a more comprehensive and inclusive historical narrative for the region. But we want to go a bit further and raise the question of the status of Islamicate archaeology on the island of Menorca. Modern historiography has not redressed the loss of memory, and we still dwell in old interpretations of the Middle Ages. What are the real limits of the concept of Medieval Europe? What does it include? Do we define it geographically? Temporally? Religiously? We will base our reflection on current research on the island of Menorca, and will try to illustrate the need to include the study of Islamicate archaeology, without which a comprehensive and diachronic study of the history of the island cannot be achieved.

10 SAADIAN MOSQUES IN MARRAKECH (16TH C.): ARCHITECTURAL AND URBAN ANALYSIS

Author(s): Almela, Iñigo (School of Arabic Studies)

Presentation Format: Oral

The congregational mosque (*masʿūd ʿāmiʿ*) is the most important element of the Islamic city, since it structures both the urban layout and the social framework which it encases, illustrating the complex relations between architecture and city. Over the last two years, we have been able to study two mosques included within large religious complexes built in Marrakesh in the second half of the 16th century. In order to approach these complexes, it has been necessary to study not only the mosque and its nearby areas, but also the surrounding urban quarters. These two late constructions share their location within a much older city, but are placed in very different enclaves. The al-Muwāssīn complex is located in a central and dense area of the medina, while the Bāb Dukkāla complex is located in a less saturated district, near one of the city gates. Consequently, the analysis of both examples and their comparison have been key to identifying common patterns as well as the solutions used to fit them to pre-existing elements. In addition to this, the examination of these mosques has clarified the reconfiguration of the urban environment around them. From a methodological perspective, this work has allowed us to analyse the need to study mosques within their urban environment, as well as to explore their connection with the surrounding neighbourhoods and the city. This work has led us to realise the shortcomings of modern methods of urban analysis in the approach to the historical evolution of the city, which needs to take into account three fundamental variables: the urban layout, the stratigraphy of the architecture and the theoretical model of the Islamic city.

11 GLAZED BRICKS IN MEDIEVAL ITALY. THE CASE OF SANTA MARIA DEL POPOLO IN PAVIA

Author(s): Milocco, Alessandra (Università degli Studi di Trieste)

Presentation Format: Oral

The presence of glazed bricks on the external facade of the Romanesque cathedral of Santa Maria del Popolo in Pavia is the subject of a long and animated debate in the field of Italian medieval archaeology. The debate largely focuses on their technological origin and their chronology, which has been fixed by means of thermoluminescence analysis in the early 12th century. Technologically, they are extraordinarily advanced, compared to other Italian glazed productions, which cannot be dated earlier than the mid-13th century, which has led to multiple theories being put forward. Gaetano Ballardini (1938) argued that these bricks were the result of local experiments, while Francesco Aguzzi's (1970) claimed that, while the bricks had been produced by locals, the covering glaze was applied by foreign artisans brought to Pavia by Venetians. In 1999, Sergio Nepoti re-analysed the material from Santa Maria del Popolo and dated these bricks by thermoluminescence to 1111 AD. These results were quickly criticized by Otto Mazzucato (2004) be-

cause of the incompleteness of Nepoti's data and the resulting lack of reliability. The distinctiveness of the Pavia bricks in the context of the Italian Middle Ages suggest that this work was probably commissioned ad hoc for the construction of the Romanesque cathedral, maybe by a costumer who was well-acquainted with that kind of architectural decoration. Probably the job was entrusted to workers from the Maghreb or Moorish Spain, also used by English and French nobles and church officials to decorate their floors.

12 THE OTTOMAN MATERIAL PAST OF GREEK MACEDONIA. AN UNWANTED HERITAGE?

Author(s): Stavridopoulos, Ioannis (University of Ioannina)

Presentation Format: Oral

The territory that constitutes modern day Greece was part of the Ottoman Empire for more than 400 years. The northern part of the country, Epirus and Macedonia, were annexed to Greece in 1912-13 after the Balkan Wars. Greek Macedonia was inhabited by large Muslim communities until the forced exchange of population in 1924. The Muslims, after five centuries of continuous presence, left a deep material imprint in the cultural landscape, including both private and public buildings. When the Greek army entered Macedonia, Thessaloniki and the other urban centres looked like typical Eastern Islamic cities, the minarets being visible from a long way. Over the last 100 years of Greek rule, the built environment of the region has changed dramatically. With few exceptions, the minarets were demolished and Ottoman architectural remains abandoned and deserted, until they eventually collapsed and vanished. The first decades after the annexation of the area to the Greek state witnessed the destruction of many Ottoman buildings, which were deemed to be barbaric, the works of conquerors, the reminders of a dark past. Some were saved because they were put to new use, and only a few were protected by the state. Until the 1980s and 1990s the Ottoman architectural past was neglected by the state, local authorities and local communities. Since, many Ottoman monuments had been listed and restored. However, still today, most Greek people do not consider the Ottoman past as their own, but something foreign, sometimes disturbing and belonging to 'others'. In this paper I will present the management of the Ottoman material past in Macedonia between its annexation by the Greek state and today. I shall examine how this past was regarded in different periods by the state, the local authorities, the local communities and the scientific community.

13 NADIN – GRADINA: A CASE STUDY OF ISLAMIC ARCHAEOLOGY IN NORTH DALMATIA (CROATIA)

Author(s): Gusar, Karla - Čelhar, Martina (University of Zadar, Department of Archaeology) - Zaro, Gregory (Anthropology Department / Climate Change Institute; University of Maine)

Presentation Format: Oral

The period of Ottoman rule is exceptionally important for understanding Dalmatian history. However, until recently, this period has been discussed predominantly in publications dealing with history and art history, while it remained almost completely neglected by archaeologists. Recently, the situation has started to change, and Ottoman monuments have been re-valorised as an important part of Dalmatian cultural heritage, as illustrated by the renovation and revitalization of the Turkish han (inn) of Vrana, near Zadar. Northern Dalmatia was an important frontier region between the Republic of Venice and the Ottoman Empire, and its rulers, as a result, changed frequently. The site of Gradina in Nadin, an important settlement already during prehistory and antiquity, became an important strategic point in the Late Middle Ages and the Early Modern Age, especially after the turbulences caused by the emergence of a new power in the region – the Ottoman Empire. The dynamism and uncertainty that prevailed in the Venetian-Ottoman border have been architecturally embodied in a fort whose remains have survived to the height of several meters, which coexist with the megalithic walls that still dominate the site to this day. In addition to the fortified complex, recent archaeological excavations have revealed a feature which is assumed to be the mosque represented on a panoramic view of Nadin dated to the 18th century. Similar constructions, also from the period of Ottoman rule and later turned into Christian churches, have been preserved in the Dalmatian sites of Drniš and Klis. The study of the record is obscured by the relatively short and intermittent Ottoman presence and the small quantity of relevant finds. This also applies to Dalmatia at large, which suggests that trade and the political relations between the Serenissima and the Ottoman Empire were complex but constant, although they were theoretically forces in conflict.

14 CONVERTING THE TOMBSTONE: REMEMBERING THE DEAD IN EARLY OTTOMAN BOSNIA

Author(s): Buturovic, Amila (York University)

Presentation Format: Oral

The transition from a predominantly Christian into the Ottoman Islamic cultural system in Bosnia in the 15th century resulted in the confluence of different styles of funerary architecture. The process of conversion to Islam among the local population, which took place in several waves after the fall of Bosnia in 1463, had lasting effects on the local death culture, funerary markers, and commemorative sensibilities. This change in religious landscape paved the way to new social relations not only among the living but also among the dead. How did first-generations of Bosnian Muslims remember their ancestors, Christian and Muslim? Although the fundamental similarity between Christian and Islamic beliefs in the afterlife and an omnipotent Creator who oversees the passage into it meant that the existing funerary forms did not have to undergo a drastic conceptual change, commemorative practices witnessed important shifts in both Muslim and Christian (Catholic and Eastern Orthodox) styles and epigraphy. This paper discusses the continuities and discontinuities in funerary culture as marked on Bosnian tombstones in the early Ottoman period. It argues that the convergence between the new imperial standards and vernacular sensibilities gave rise to new funerary forms and texts across the religious divide, but it also allowed for the continuation of social intimacy and shared cultural memory for centuries to come.

15 THE CITY OF BOLGAR IS A MAIN CENTER OF ISLAMIC ARCHAEOLOGY IN THE NORTH OF EASTERN EUROPE

Author(s): Sitdikov, Airat (A. Khalikov Institute of Archaeology Tatarstan Academy of Sciences)

Presentation Format: Oral

In the 10th and 11th centuries, the city of Bolgar was the capital of the state of the Volga Bulgaria, one of the largest medieval Muslim states in Eastern Europe. In 922, Bulgarians adopted Islam as the official religion of the state. In the 10th century, the coinage issued by the city became a symbol of the new state. The city, which always was the focus of attention of Arabic and Persian writing traditions, which mention the city as early as 920-921. In the 12th century, the city became an important international trade hub. During this period, following ecological change and the construction of modern communication systems, the economic activity of the city expanded, until it was taken and burnt by the Mongols in 1236. In the 13th century, the city, which was frequented by the Golden Horde khans in the 1260s, played an important role in the state established by the Golden Horde, issuing coinage from the 1240s and 1250s. This presence actively developed Muslim architecture - palace buildings, feudal manors, caravansarais, cathedral and mosques, mektebe and medresse, public baths, mausoleums - while preserving numerous cultural traits from the pre-Mongolian and Mongolian period.

16 THE CENTRAL MARKET (BAZAAR) OF CITY BOLGAR - THE SIGN OF ISLAMIC URBAN CULTURE IN THE HEART OF EASTERN EUROPE

Author(s): Koval, Vladimir - Badeev, Denis (Institute of archaeology Russian Academy of Sciences)

Presentation Format: Oral

Excavations at the central market (bazaar) in the city of Bolgar have almost completely uncovered the remains of a large building (37 x 34 m) with four entrances and a system of passageways that connected the shops inside. The bazaar was built in the 1350s and destroyed 10-20 years later. The walls were made of bricks and rested on stone foundations, while the roofing was made of wood. The building of the bazaar demonstrates the adoption of the architectural styles of the Islamic East (Iran, Turkey) in the forested regions of Eastern Europe. The excavations have yielded very valuable material for the analysis of the commercial relationship between Eastern Europe and Iran, Byzantium, China and Western Europe. The bazaar was a trading hub for imported fabrics, goods manufactured in precious metal and other luxury commodities. The bazaar in Bolgar is the first of its kind found on the forested regions of Eastern Europe. In the cities of Old Russia and the post-ancient cities of the Northern Black Sea region, trade was largely conducted in open areas. The bazaar demonstrates that Oriental (Islamic) trade penetrated far beyond the areas dominated by Islamic religion. Islamic traditions in monumental architecture, trade and urban landscaping (water supply, public baths, etc.) were brought to Bolgar by immigrants from Eastern countries (primarily the Transcaucasus and Central Asia), among whom there were not only Muslims, but also Christians, who were nevertheless imbued with Islamic traditions (Armenians). Their contribution to the urban culture of Bolgar completely transformed the urban layout, and brought it closer to Oriental (Islamic) standards. However, in a number of ways, urban life in the region differed from the purely Islamic model, especially concerning house construction, the organization of crafts and ritual, which preserved many pagan traits.

17 SCRATCH A RUSSIAN AND YOU'LL FIND A TATAR: THE IMPACT OF ISLAM AS REVEALED BY ARCHAEOLOGY OF MOSCOW STATE

Author(s): Beliaev, Leonid (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Is this well-known expression true? In global historiography, Late Medieval Muscovy is usually described as a country at the edge of the Christian Universe, the frontier with Islam, a semi-Islamic territory, at least from the point of view of material culture (dress, weaponry, jewellery, etc.). So far, archaeological research in Russia has focused on identifying the penetration of elements of Islamic material and artistic culture, which is a necessary condition, but not quite sufficient to support such assertions. We need to discuss approaches to the archaeological analysis of the Muslim contribution to the development of Muscovy, as well to establishing whether this possibility should be contemplated at all. This approach must be based on the following points: (a) to outline and characterize areas of intersection of various cultural influences; (b) to identify the forms which this contact took and its periodisation; (c) to understand ways for the primary perception of phenomena which led to the emergence of distinctive national cultures in the Middle and Modern ages; (d) to trace the evolution of these phenomena further down the line; (e) to try to understand whether the past of the region was dominated by a mono-cultural archaeological record, shared by co-existing groups that spoke different languages and belonged to different confessions. Eventually, we would recognize that Central Russian played a role as a conventional "contact zone". Its culture was less dependent of the Islamic influences than some Mediterranean regions, such as Spain (al-Andalus), the coastal states of Southern Italy and Sicily, the Balkans and, at a later date, the Byzantine principalities.

18 BENEATH THE MAUSOLEUM OF THE 14TH CENTURY: THE STUDY OF THE FAMILY TOMB

Author(s): Elkina, Irina (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

In 2012, during excavations of a low hill in the southern part of the Bulgarian hillfort (Bolgar, Tatarstan), the ruins of a badly-damaged

stone mausoleum were discovered. The mausoleum was rectangular in size (10,2 x 9,7 m). The interior of the building was octagonal and its entrance was marked by two large pylons. The basement of the mausoleum consisted of one course of large roughly worked stones of elongated shape. The stones stood close to each other at an angle. Inside the mausoleum there are 9 burial places, three of which had been destroyed by looters. All the corpses were in box-type coffins, made of thick and wide boards. In one of the burials were found the remains of a female headdress consisting of several textile items and 9 ring-shaped pieces of yellow metal suspended on a tape (the tape was not preserved). The upper textile object is a silk shawl embroidered with gold threads. Under the foundations of the mausoleum, a round ditch with a depth of about 1 m was also found. The purpose of the ditch is uncertain. Presumably, the mausoleum was built on the site of an older building. A cemetery was located around the mausoleum, including over 90 burials, most of which follow the Islamic ritual, but some deviate from this tradition (incomplete cremation, burial in box-like coffins or decks, burial with the remains of ritual treasures, burial with animal sacrifices). Grave offerings are rare. The most interesting find is an assemblage of silver jewelry, consisting of lamellar bracelets whose ends are shaped like lion's faces, dirham pendants, two amulets and decorative pins. These items were wrapped in silk cloth and laid in a grave.

19 'NOMADIC ISLAM:' AN ARCHAEOLOGICAL APPROACH TO THE ISLAMIZATION OF THE CASPIAN STEPPE

Author(s): Shingiray, Irina (University of Oxford)

Presentation Format: Oral

Islam arrived North of the Caucasus from the territories of the Caliphate in the 9th and 10th centuries AD. Its influence and material culture found its way throughout Eastern Europe and all the way to Scandinavia. As recent archaeological research indicates, there was no barrier to the penetration of Islamic objects, communities, and ideas deep into European regions during the Early Middle Ages. This cultural exchange and transmission of goods and people was often facilitated and promulgated by the nomadic communities of the Eurasian Steppe, such as the Khazars, the Oghuz, and others—nomadic groups which were gradually converting to Islam during that time period. Yet, some erroneous stereotypes have crystallized and continue to be reiterated in numerous historical narratives stating that those nomads, for instance the Khazars, served as a barrier and a military force that stopped Islam on its way to Europe; or that the Oghuz were not “firm” believers; or that Islam “sat lightly” upon all nomads. Archaeological research is in a unique position to provide evidence that can debunk such clichés regarding nomadic beliefs and actions. In this paper, I will discuss some archaeological approaches to locating Muslim graves in the Caspian Steppe—the nomadic core territory—and how we should interpret the pluralism of “Nomadic Islam” by situating it in the wider archaeological context of mortuary practices in the Early Middle Ages across different regions.

20 THE CULTURAL HERITAGE OF THE 14TH- 15TH CENTURIES IN THE ARCHAEOLOGY OF THE NORTH BLACK SEA AREA

Author(s): Biliaieva, Svitlana (Institute of Archaeology of National Academy of sciences of Ukraine)

Presentation Format: Oral

The archaeological investigation of fortresses and cities in the North Black Sea region has revealed new features in the historical and cultural development of the region during the 14th and 15th centuries. The interaction of several civilizations and states, including the Golden Horde, the Crimean Khanate, the Ottoman Empire, the Moldavian Principality and the Great Principality of Lithuania and Rus, as well as the presence of Genoese and Venetian merchants, resulted in the emergence of a common material culture. This can, for example be attested in the cities of the Golden Horde between the Dniester and the mouth of the Dnieper in the late 14th century and the fortresses built by Moldavian (to the west) and Lithuanian princes (to the west and east). This also applies to the settlements in the Lower Dnieper region. This form of cultural syncretism, reinforced by active commercial relations, can be detected in the archaeological record of the region between Akkerman (on the Dniester) and the fortress and city of Tyagin (on the Dnieper). Sites in the region show different proportions of Eastern and Western elements during the Golden Horde period, but there are a large number of common traits, especially in ceramics, metal adornments in leather items, and coins. Investigation of the material record allows the archaeologist to trace global trends and development of this complex historical period.

a. ISLAMIC GLASS ON THE VOLGA: EXOTIC OR ORDINARY?

Author(s): Valiulina, Svetlana (Kazan Federal University)

Presentation Format: Poster

The Volga Bulgaria state was the main market for Islamic glass in Eastern Europe. Finds relating to the early stage of formation of the Bulgar urban culture and dated to the 10th-early 11th century, are few but very representative: scent bottles, reference weights, inkpots, lamps – personal belongings or gifts for ambassadors and merchants. From the second half of the 11th century onwards, Oriental glassware and window glass gained popularity in Bulgar towns. In the 12th century, the settlement of Bilyar was host to a number of workshops producing glass tableware and window glass. The nomenclature, quantity and geography of Middle Eastern glass items found in Eastern European sites changed radically after the Mongol invasion, in the mid-13th century, due to political events and in line with the general trends detected in Islamic glassmaking. The Golden Horde period is notable for the spread of Syrian and Egyptian gold-coated and enamelled vessels, as well as a gradual decline of Iranian imports. In the Lower and Middle Volga region, the production of glass beads, pendant ornaments, and finger-rings clearly predominated; these items greatly outnumber other shapes, such as tableware and other types of glassware; Golden Horde settlements produced mainly decorative glassware,

and close to no glass tableware. Apart from Middle Eastern ceremonial items – lamps and vessels – Lower Volga settlements have yielded a wide variety of everyday simple tableware of Central Asian origin. Between the mid-13th and the 15th centuries, Middle Eastern artistic glassware was being transferred to Eastern Europe through the Crimea and further on, either down the Dniepr River and its tributaries to western Russian territories or, especially, through Golden Horde-dominated areas to the Northern Caucasus and the Volga region.

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CONTINUITY AND TRANSFORMATION IN WESTERN MEDITERRANEAN COMMUNITIES DURING THE FIRST MILLENNIUM BCE

Theme: Mediterranean seascapes

Organisers: Balco, William (University of North Georgia) - Ferrer Martin, Meritxell (Universitat Pompeu Fabra) - Sevara, Christopher (University of Vienna)

Format: Regular session

The western Mediterranean has long been a nexus of cultural contact, interaction, continuity, and transformation. It is a social intersection where indigenous populations intensively encountered both Greek and Phoenician settlers, seeding the growth of a complex, multifaceted social entanglement from the Late Bronze Age to the Iron Age. Consequently, the western Mediterranean is a perfect setting to study ancient culture contact, colonial relations, and social transformation processes. Concomitantly, it is an ideal locale to analyze the construction, negotiation, and representation of new identities, landscapes, and power dynamics. Over the past 20 years, many archaeological investigations in the region have explored the indigenous populations prior to and during this transformative period. The wealth of new spatial and contextual information facilitates a reexamination of traditional Mediterranean archaeological narratives through the analysis of models of movement, occupation, and interaction both within and between the various groups of people living concurrently throughout the region. This session aims to contextualize the indigenous populations that occupied the western Mediterranean during this period, exploring their landscapes, politics of identity, power dynamics, interconnectivity, social continuity, and transformation, as well as the transformative effects they may have had on their colonial counterparts. This session gathers a multitude of voices, both Mediterranean and foreign, to more comprehensively contextualize Late Bronze Age and Iron Age people, cultures, sites, and landscapes in the region. We welcome all papers dealing with these issues, including those presenting new and previously investigated topics that have yet to be published.

ABSTRACTS

01 CONTINUITY AND TRANSFORMATION IN THE COMMUNITIES OF SOUTHERN SICILY DURING THE 01ST MILLENNIUM BC

Author(s): Gulli, Domenica (Soprintendenza Beni Culturali di Agrigento)

Presentation Format: Oral

Since the 1980's there has been a considerable increase of the evidence about the Aegean-Mycenaean presence in the territory of Agrigento, which immediately assumed specific connotations about the chronology, the ways and the outcomes of this "contact". The best-known sites are the village of Cannatello (15th-13th century BC), where it has been possible to identify several Aegean components, among which a Cypriot one, of Chiesa Madre and Monte Grande at Palma di Montechiaro. In the latter site a cultural enclosure/workshop, possibly connected with the extraction and the smelting of Sulphur has been exposed. The landings along the Agrigento coast, particularly Monte Grande and Cannatello, constitute the bases for further inland occupation along the Platani valley, known also as "the route of salt and sulphur". Here, the presence of Aegean people has left testimony in the ceramics and in the bronzes of importation and of local imitation, as well as in the widespread presence of the type of the tholos tomb. In the monumental necropoleis of Sant'Angelo Muxaro and Ribera, the vast tholos tombs have been continuously used from the 12th to 6th century BC. These evidences clearly suggest a very strong cultural identity, in which indigenous characteristics are related to strong Aegean connections. On their arrival on the Agrigento coast, Greek settlers found the indigenous communities perched in "kingdoms" dominating the internal territory, such as Sant'Angelo Muxaro, Polizzello, Casteltermini, all fortified sites placed along the Platani river. In particular, evidence from the site of Sant'Angelo Muxaro will be discussed. This is commonly identified with the indigenous town of Kamikos, the capital of the Sicilian kingdom of king Kokalos, where the Cretan king Minos, who arrived in Sicania in search of Daedalus, found violent death.

02 A NEW SETTLEMENT OF THE GREEK AGE IN THE HINTERLAND OF GELA (SICILY)

Author(s): Muratore, Sebastiano (Tubingen Universitat) - Congiu, Marina (Soprintendenza di Caltanissetta) - Calà, Gianluca (Soprintendenza di Caltanissetta)

Presentation Format: Oral

This paper intends to present for the first time to the scientific community the important discovery of a new archaeological site

carried out during the surveillance works for the construction of a wind farm in the district of Butera (CL, Sicily).

By a clearly indicative toponym, Monte Gricuzzo is a modest relief (534 m a.s.l.) mainly characterized by sandy soils. The settlement is located on the SE slope of the hill, facing the mountains of Gibliscemi and Dessueri, both sites of the facies of Pantalica Nord (XIII-IX century BC).

Although still in a preliminary phase, the structures brought to light on Monte Gricuzzo through two probes allow us to affirm that it is a large and articulated settlement, certainly autonomous in the needs of the community that settled here. The part of the settlement so far excavated has at least two phases of presence: the most recent of these is located during the fourth century b. C.; the presence of more ancient ceramic fragments, mainly found on the surface in the neighboring area and also inside one of the rooms, suggests a presence in the Archaic period.

The excavations allowed to clarify only a part of the general layout of the settlement and to fully investigate only two rooms.

Now we intend to provide you data coming from both surveys and excavation of the rooms, whose structural and stratigraphic articulation allows us to advance hypothesis about this area as designed for work activities.

At the same time the project "An Archaeological SIT for Monte Gricuzzo" will be presented.

03 INVESTIGATING MOVEMENT AND PERCEPTION AS AN AID TO UNDERSTANDING SOCIOECONOMIC CHANGE AND CULTURAL RELATIONSHIPS IN PRE- AND PROTOHISTORIC WESTERN SICILY

Author(s): Sevara, Christopher - Doneus, Michael (Department of Prehistoric and Historical Archaeology, University of Vienna) - Draganits, Erich (Institute of Applied Geology, University of Natural Resources and Life Sciences, Vienna) - Salisbury, Roderick - Schilk, Sheba (Department of Prehistoric and Historical Archaeology, University of Vienna) - Tusa, Sebastiano (Soprintendenza del Mare, Regione Siciliana)

Presentation Format: Oral

In recent years, researchers have theorized that the abandonment of numerous indigenous settlements in western Sicily during the mid-first millennium BC may have been due to regional catastrophic events, external pressure, or to socio-political/religious/economic processes causing native populations to centralise under emerging elite power structures. Increasing aridity, which may have been brought about in part by inhabitants' own intensification of land use, might also have played a significant role in the restructuring of the landscape. Evidence suggests that people living in the west during this period were embroiled in an array of environmental, social and political processes whose consequences may have had cumulative and iterative effects on settlement stability in the region. Recent results from the Prospecting Boundaries project (<http://mazaru.univie.ac.at>), provide similar indications. How might people have been moving in and perceiving the environment during these periods as they moved to occupy and exploit changing landscapes? What insights can regional spatial analytical approaches provide on movement, occupation, and social transformation in western Sicily during the early to mid-first millennium BC? This paper examines these issues from a geospatial perspective, rooted in the available archaeological data but taking advantage of recent advances in spatial data collection, visibility and movement analysis that may be able to shed further light on not only the effects of these past events in the physical and cultural landscape, but also on the current gaps in our spatial, archaeological, and environmental knowledge of the period.

04 URBAN SPACE AND LANDSCAPE: SETTLEMENTS AND LOCAL COMMUNITIES IN IRON AGE WESTERN SICILY

Author(s): Spatafora, Francesca (Museo Archeologico Regionale)

Presentation Format: Oral

The first centuries of the first millennium and the transition from the end of the Bronze Age to the Iron Age represent, undoubtedly, critical moments in relation to the possibilities of understanding and comprehending modes of population that precede the creation of large urban concentrations that characterize western Sicily from at least the seventh century BC. The way of living during the Iron Age is, however, closely linked to the landscape, including morphological and environmental contexts that certainly contributed to determining choices in the location of settlements, and to influencing the organization of urban spaces. Historical evidence, including the brief testimony of Diodorus, corresponds fully with the archaeological evidence. According to the Historian of Agrigento "The Sicani, then, originally made their homes in villages and had chosen for their settlements the hills that by nature offered them maximum security..." (Diodorus V, 6.2). In reality, this model for indigenous settlement choices in central-western Sicily begins at the end of the seventh century BC. Local communities gathered their populations within mountaintop settlements of varying size following the consolidation of the Greek presence in the western territories. This is a settlement mode that ensures control of the main communication routes, as well as the ability to defend cities and countryside. However, the following century saw a formalisation of this settlement style. This attests a political consolidation conducted through the creation of a hierarchical organization, with large centers delimited by the creation of city walls, around which there were medium sized settlements and small villages. The latter are located in the areas of the valley floor and instrumental for agricultural practices. This situation also underlines a strong sense of belonging to local communities, expressed through a widespread, capillary control of the territory and a close relationship with the natural environment.

05 BUILDING LOCAL RESPONSES: RITUAL ARCHITECTURES IN WESTERN SICILY (10TH-5TH CENTURIES BC)

Author(s): Ferrer Martin, Meritxell (Universitat Pompeu Fabra)

Presentation Format: Oral

In recent years the entrance of postcolonial approximations to the study of the Mediterranean during the first Millennium BC has begun to broke the long hegemony that until nowadays have held acculturative interpretations whose, with their views made only from the colonies –both Greek and Phoenician–, have interpreted native populations as static and monolithic entities, simply passive recipients of colonial innovations.

According to postcolonial postulates, the interests of this paper focus on evidence and analyze the agency of Sicilian populations through a comparative study of communal ritual spaces of contemporaneous native settlements located in central and western Sicily. In particular, my aim is to analyze social, politic and historical dynamics of these local communities in a period characterized by the establishment of regular relations with surrounding colonies through the analysis of their ritual architectures and the use of these communal spaces. The realization of this comparative study has twofold aim. Firstly, it wants to visualize and highlight the diversity of responses offered by native Sicilian populations –in space and time– to the colonial world. Secondly, to point out the agency of these local communities on the selection, negotiation and elaboration of architectural materialities completely consistent with their own historical presents.

06 ARCHAIC SICILY AND THE CONSOLIDATION OF RELIGIOUS PRACTICE

Author(s): Urquhart, Lela (Getty Research Institute)

Presentation Format: Oral

This paper discusses the transformation of indigenous religious practice in central-western Sicily between the late Iron Age and Classical period. Applying an empirical definition of religion and quantitative methods, it shows that activities customarily described as “religious” are, by and large, difficult to delineate in the archaeological record for indigenous Sicily prior to the mid-seventh century BCE. Evidence for customs such as sacrifice, architectural monumentality, or votive offering (three of thirteen material correlates of religion identified in this paper) is not non-existent, but it occurs diffusely and disparately, and only occasionally comes together in a single context to make a strong archaeological impression. Starting in the seventh century, this pattern changes, and traces of religious activity appear more frequently and with greater concentration across the entire region of central-western Sicily. In addition, the mode of religious expression also grows more consistent over time; where earlier forms of votive dedication, for example, ranged from pottery to bone tools to metal objects, by the early Classical period, dedicatory offerings were primarily ceramic, and often consisted of a set assemblage of items.

This paper thus argues that the Archaic period in Sicily was a time of religious consolidation for indigenous groups in Sicily. The Archaic period also saw the establishment and growth of Phoenician and Greek settlements in the region, and exposure to the religious practices of “colonial” groups likely contributed to the sudden spike of evidence corresponding to “religion” in the archaeological record after 700 BCE. Indigenous groups experimented with both colonial and their own “traditional” Iron Age practices over the course of about 175 years before gradually conforming to a consolidated form of indigenous religion.

07 RETRACING SOCIAL INTERACTION AND TRANSFORMATIONS IN ANCIENT SELINUNT

Author(s): Jonasch, Melanie (German Archaeological Institute)

Presentation Format: Oral

Western Sicily in the 1 millennium BCE is a unique research area for the study of cultural interaction and the transformation of society and material culture. Greek and Phoenician agents encountered Sicilian Iron Age populations and interacted with each other in a number of ways, from peaceful exchange and cultural mixing to violent confrontations of considerable consequences.

One major player in the area was the Greek polis of Selinunt, founded in the late 7th century BCE by settlers from Megara Hyblaea. There is no doubt that the city and its political and social (inter)actions had a deep impact on the cultural landscape of western Sicily. At the same time, however, also the population of Selinunt did not remain unaffected by the wide-ranging contacts and conflicts with various neighbors and the wider Mediterranean. This holds particularly true for the period after the disastrous conquest of the city by the Carthaginians in 409 BCE. Despite decades of research, there is still much to learn about the structure, the functioning, and the status of the city, and especially about the social composition of its inhabitants in the late Classical and Hellenistic periods.

This paper aims to briefly summarize our knowledge of social interaction and the transformation of society and material culture in the light of past research and will serve as an introduction to upcoming projects of the German Archaeological Institute in the city of Selinunt.

08 CONTEXTUALIZING IRON AGE CONTINUITY AND TRANSFORMATION IN THE TERRITORY OF ALCAMO (TP), SICILY

Author(s): Balco, William (University of North Georgia) - Giglio, Rosella (Soprintendenza di Trapani)

Presentation Format: Oral

Recent archaeological research in the Territory of Alcamo, Sicily, has identified evidence of occupation and land-use spanning the first millennium BCE. Such evidence is readily identified at several sites including atop Monte Bonifato, a prominent summit commanding a strategic viewshed of numerous river valleys and the Gulf of Castellamare. This paper addresses continuity and transformation in western Sicily, focusing on Iron Age Elymian settlement and economic interaction. First, we will contextualize Iron Age Elymian settlements in the Territory of Alcamo within the broader expanse of western Sicily. Second, we explore the Iron Age and Archaic pottery assemblage recovered during recent survey atop Monte Bonifato. The preliminary results of the pottery recovered during this survey on Monte Bonifato suggest a substantial Iron Age settlement in contact with Phoenician and Greek traders. Finally, we present a preliminary interpretation of Monte Bonifato's economic role as a producer and consumer during the Iron Age and Archaic period, comparing it to other sites in the region. Ancient economic interactions between Elymian settlements and colonial Greek and Phoenician ones in western Sicily attest the degrees to which continuity and transformation was accepted among the Iron Age and Archaic population centers. This paper contributes to our understanding of social and economic transformations during complex social entanglements in western Sicily.

09 THE STRANGER'S WELCOME ON ARCHAIC MONTE IATO: FROM HUTS TO CLUBHOUSES AT THE CULT PLACE AROUND THE APHRODITE TEMPLE

Author(s): Mohr, Martin (Institut für Archäologie der Universität Zürich. FB Klassische Archäologie) - Kistler, Erich - Öhlinger, Birgit (Institut für Archäologie. Leopold-Franzens-Universität Innsbruck)

Presentation Format: Oral

While the cult place of the earlier 6th century seems to be of regional range with festive activities focusing on ritual meals taking place in huts and on festive courtyards, from 550 BC onwards a few families on Monte Iato deliberately began to undertake hospitality and networking with the tyrants and aristocrats of the Greek coastal cities. It was through this hospitality that goods, technologies, and craftsmen also arrived on the hill. Its first monumental reification was the first phase of the Aphrodite Temple dating in the last quarter of the 6th century. Although the architecture of the temple was based on Greek forms, the typical adyton and altar was missing. Instead it was equipped with a sacrificial hearth place within, showing that the Temple may have served as *primus inter pares* to invite regional headmen for mutual consultations and sacrificial meals. The Greek architectural form gave this new social body within the local social fabric of extended families or clans a solidly built shape. For this reason, the builders of the temple expressed a durable claim to regional leadership in monumental ways.

Around 500 BC the transformation of the Temple into an outright cult shrine attests a fundamental change. As a result the hearth and sacrificial place inside the temple was replaced by an altar on the temple's forecourt being characteristic of the architectural concept of a Greek sanctuary. Five clubhouses erected by foreign guests east and west of the Temple after 500 BC attest to the interregional importance of the sanctuary. To prevent being socially dislocated from their indigenous milieu, the return to imaginary age-old cults and rituals was simultaneously forced. Apparently, such a religious reference to local authenticity and identity was needed to make this new globalized environment socially and politically tolerable within the indigenous societal framework.

10 CHARRED PLANT REMAINS FROM EARLY IRON AGE WESTERN SICILY: ENVIRONMENT AND SUBSISTENCE STRATEGIES AT MONTE POLIZZO

Author(s): Stika, Hans-Peter (University of Hohenheim in Stuttgart)

Presentation Format: Oral

During the early Iron Age, Sicily was inhabited by several ethnic groups: indigenous Sicilian settlements as well as Phoenician/Punic and Greek colonies were situated close to each other and interacted in complex ways affecting political, cultural and economic life. Replacing the once popular idea of the indigenous people being "colonized" by the Greek, the alternative term of "transculturation" has been suggested, which more directly points out the mutual character of these interactions. Cultural distinctions in the use of cereals and pulses can also be discussed. While the Elymians at the inland site of Monte Polizzo used hulled barley (*Hordeum vulgare*) and emmer (*Triticum dicoccum*) as well as faba bean (*Vicia faba*) as the main cereals and pulses, the Greek harbor town of Selinunte displayed free-threshing wheat (*Triticum aestivum/durum/turgidum*) and bitter vetch (*Vicia ervilia*) as dominant crops. There are no hints for olive use (*Olea europaea*) at Monte Polizzo, while charcoal of olive tree was analyzed there, which points to different food systems: Greek olive oil versus Elymian animal fat. The beams at Monte Polizzo used for roofing indicate natural mixed forest stands, documented by deciduous and evergreen oaks (*Quercus*) as well as by elm (*Ulmus*) together with the absence of pine species (*Pinus*), suggest undisturbed climax woodland in the vicinity. The same is true for the northwestern hinterland of Selinunte, where palynological results from Gorgo Basso suggest widespread undisturbed climax vegetation together with hints for meadows and pastures but not for cereal cultivation. At "House 1" on Monte Polizzo, the archaeobotanical record matches well with the archaeological interpretation of different rooms used for ritual consumption, everyday life, crop processing and crop storage. During feasts in the style of Greek symposia, grapes and figs were consumed. Aside Greek adaptations traditional local Elymian elements were kept, too.

11 ARIZONA SICILY PROJECT: PRELIMINARY RESULTS

Author(s): Blake, Emma - Schon, Robert (University of Arizona)

Presentation Format: Oral

This paper presents the results from the first season of the Arizona Sicily Project, an intensive diachronic survey in the coastal territory between the Sicilian cities of Marsala and Mazara del Vallo. The project's primary research aim is to document the quantities of North African imports to western Sicily in all periods, in order to reconstruct North African connections to the peoples of this part of the island. Previous work in the region has demonstrated high numbers of North African artifacts making their way across the Sicilian Channel in punctuated periods from the Paleolithic onwards, but this project is the first to attempt to document and quantify those contacts over all periods, to understand the deep history of these relations, and how they distinguish the western third of the island from other parts of Sicily. The ample evidence of African imports in the Punic and Roman periods seems at first glance to reflect the political circumstances of the time, but given the evidence of imports before and after, the environment (for example the narrowness of the Channel and features of its currents) and shared local communities of practice (fishing grounds) may serve to explain these continuous contacts better than short term top-down political transformations.

12 ORGANIZATION AND TRANSFORMATION IN SULCIS LANDSCAPE DURING THE PHOENICIAN AND PUNIC AGE: A FOCUS ON PANI LORIGA

Author(s): Tirabassi, Livia - Botto, Massimo (Istituto di Studi sul Mediterraneo Antico ISMA - CNR) - Madrigali, Emanuele (Independent Researcher)

Presentation Format: Oral

The Phoenician presence in Sulcis landscape is characterized from the 8th century BC by a precise program of exploitation, which moves from the powerful settlement of Sulky, on the island of Sant'Antioco, to the innermost parts of the region. Thanks to the latest researches, it can be affirmed that such a territorial control was structured through different types of settlement organized in a hierarchical manner. A new pulse can be observed from the last decades of the 7th century BC through the creation of a defensive system focused on the sites of Monte Sirai-Nuraghe Sirai, the mixed Indigenous-Phoenician settlement of Nuraghe Tratalias and the hill of Pani Loriga.

In this system Pani Loriga occupied a strategic position of primary importance, as the settlement acted as a link between the coastal hinterland and the internal areas of the country, rich in minerals and agro-pastoral products. This function was maintained throughout the following Punic phase. The overview reached by the ISMA-CNR (Istituto di Studi sul Mediterraneo Antico) investigations at Pani Loriga is that of a scattered settlement, with living areas arranged on a wide area across the hillside and with probably differentiated functions. In fact, there is a clear difference on a structural and organisational level between the houses on the southern plateau (Area A), the large building on the northern side (Area B) and the complex located on the acropolis (Area C). The location of the site attests an early interest in this part of the island - inhabited since Prehistoric age - by Phoenician people and the role of settlement of Pani Loriga in both a local and Mediterranean exchange network.

13 CULTURAL ENCOUNTERS AND EVERYDAY LIFE AROUND A NURAGHE IN PHOENICIAN AND PUNIC SARDINIA

Author(s): Van Dommelen, Peter (Brown University) - Stiglitz, Alfonso (Museo Civico San Vero Milis)

Presentation Format: Oral

Nuraghi, the famous dry-stone walled towers of Sardinia, are usually regarded as prehistoric monuments, because they were first built in the Bronze Age. They continued to be inhabited long after, however, and survived as often substantial settlements into later periods. Nuraghi should therefore be key sites for the investigation of the colonial encounters and cultural interactions between local Sardinians, Phoenician traders and Punic settlers, because they are the only places that were continuously inhabited before and during the colonial presence of Phoenicians and Carthaginians in Sardinia - in practice, however, few nuraghi have been investigated for understanding Phoenician and Carthaginian colonialism.

This observation was one of the reasons in 2013 to start excavations around nuraghe S'Urachi, which is situated in the Upper Campidano and Gulf of Oristano regions of west central Sardinia. Standing halfway between the rapidly rising slopes of the Monti Ferru to the north and the extensive salt marshes and lagoons of Cabras to the south, its inhabitants enjoyed easy access to a wide range of environmental zones. S'Urachi is one of the largest nuraghi in the region, while it is also just 15 miles away from the Phoenician colonial settlement of Tharros, and a rich variety of imported objects suggests that the site has long been a key place of colonial encounters.

In this presentation, we outline the key results of the past five years of excavation at S'Urachi, showing first of all the continuity of occupation throughout the first millennium BCE, and the extent and depth of cultural interactions at the site between Phoenicians and Iron Age 'Nuragic' Sardinians.

14 TRACKING CHANGE IN THE SOCIAL ARENA. LANDSCAPE AND MONUMENTAL ARCHITECTURE IN THE BALEARIC ISLANDS DURING THE IRON AGE.

Author(s): Galmes Alba, Alejandra - Calvo Trias, Manuel (ArqueoUIB Research Group, University of the Balearic Islands)

Presentation Format: Oral

The socio-political landscape of the Balearic Islands is key to helping us understand the patterns, and networks of connectivity in the Western Mediterranean during the Iron Age. By focusing on the monumental architecture, and changes to it, we have been able to draw inferences about long-term changes in the social, political and symbolic arenas from this period. This approach has given us new insights, and the ability to trace the political landscape of the Balearic Islands during the Iron Age.

Through the application of field surveying and GIS spatial analysis, we aim to gain an insight into the shifting political landscape, through the study of settlement patterns and architecture. As the construction of monumental buildings enhances the spaces in which they are built, and the activities they are built to house, changes to these buildings are significant as they reflect changes in the socio-political landscape. Therefore, the study of this architecture can give us an insight into the political landscape of the islands, thanks to the fact that they offer snapshots of different social arenas in different moments. At the same time, encompassing the study of the inner landscape with the set of connections established beyond the islands, helps us to understand how the political arenas were constantly reshaped, and how the Balearic Islands were often connected, in a very particular way, with the wider Mediterranean.

15 THE TIES THAT BIND: MARITIME TRADE NETWORKS IN THE ARCHAIC WESTERN MEDITERRANEAN (7TH-6TH C. BCE)

Author(s): Salay, Paul (University of Southern California)

Presentation Format: Oral

It has long been established that the 7th and 6th centuries BCE witnessed a rapid expansion of the Greek world in the western Mediterranean, involving substantial increases in trade and other contacts between Greeks and indigenous peoples in the region. However, the prevailing tendency to view this period through the lens of Greek colonial expansion has often occluded the active participation of a diverse mix of Italic peoples, not to mention those of southern France and the Iberian Peninsula. As one way of addressing this challenge, I will conduct a study on the nature and extent of maritime exchange networks in the western Mediterranean through a data-driven analysis of pottery assemblages from several different sites: Tarquinia (Etruria), Salento (S. Italy), and Empúries (NW Spain). While the challenges to such a comparative approach are numerous (see Lawall, 2011; Orton & Hughes, 2013), a careful analysis of the data suggests several different features of archaic maritime trade. First, it seems that traders had already connected Greek producers with Etruscan consumers by the 8th c. BCE. Second, consumer preferences varied substantially from region to region, and that as early as the 7th c. BCE, trade networks had developed sufficiently to deliver goods specifically to satisfy those demands. Third, the ceramics data indicate a sharp increase in both the volume and complexity of maritime commerce during the 6th c. BCE. In short, the ceramic evidence demonstrates complex, regionally specific, iterative trading relationships involving the active participation of local populations both as consumers and producers, and adaptive distribution networks capable of targeting discrete groups of trading partners and providing feedback to producers that allowed them to alter production strategies in direct response to specific consumer preferences.

092 INTERPRETING AND UNDERSTANDING THE PAST THROUGH MEDIEVAL SMALL FINDS

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Lewis, Michael (British Museum; Portable Antiquities Scheme) - Kars, Mirjam (VU University; Portable Antiquities of the Netherlands) - Højmark Søvsø, Mette (Sydvestjyskemuseer) - Sawicki, Jakub (Academy of Sciences of the Czech Republic)

Format: Regular session

Archaeological small finds of the High to Late Middle Ages (c.1100-1550) are amongst the most common artefact types found by archaeologists and others, but not always the focus of rigorous academic study or research. It is not clear why this is so, especially as the Middle Ages resonates with the public, being close in time and culture, and that the small finds themselves have great potential for scientific research and academic investigation.

The purpose of this session is two-fold. First to explore methods of how to interpret and understand archaeological small finds of medieval date, whether this is through new digital or scientific techniques or more traditional approaches. We would be particularly interested in papers that explore medieval finds within the historic landscape, and how this data is then presented to the wider public to help them visualise and understand the medieval past.

Second, we are interested in the relationship between finds types, and how they help us understand life in the medieval past. Papers might consider, for example, the relationship between particular object types and specific peoples, human activities or social hierarchy. It might be that papers offer different approaches to understanding and interpreting material culture, such as through typologies, style or their composition, or explore archaeological data through historical and art historical evidence. Likewise we are interested to here of diverse approaches

ABSTRACTS

01 **AGITATED MINDS AND SMALL FINDS: AN ARCHAEOLOGY OF LATER MEDIEVAL EMOTION**

Author(s): Standley, Eleanor (University of Oxford)

Presentation Format: Oral

'Emotion' can be defined as an agitation of the mind or strong feeling. How did such an intangible but significant facet of medieval life manifest itself in the physical world of material culture?

This paper investigates the archaeology of emotion and small finds from medieval Britain. The concept of 'emotion' will be explored, together with the effect human emotions had on objects, such as their designs, uses and deposition, and how objects might have affected emotions.

Fear, love, joviality, lust, pride, and sentimentality are just some of the emotions that can be associated with small finds, such as dress accessories, seal matrices, spindle whorls, and coins. Key questions can be asked of such past possessions: how were things imbued with emotion; how were they emotive; and how does medieval material culture affect our emotions today?

Archaeologists, metal detectorists, curators, and the general public can all have an emotional response to historic objects. Can this be used to develop our interest in, and understanding of, the past?

Our interpretation of how medieval people felt may be subjective, but by using objects to understand emotions, and emotions to understand objects, a method of interpretation can be arrived at. Ultimately this paper will attempt to reconnect intangible emotions with the tangible things of the medieval past.

02 **LOVE SEX MAGIC IN MEDIEVAL EUROPE: THE ARCHAEOLOGICAL EVIDENCE**

Author(s): Watson, Gemma (University of Reading)

Presentation Format: Oral

Love magic was used for a variety of purposes connected to love, sex and reproduction in the Middle Ages. It was most often used to arouse love or sexual desire, or to impede it by causing hatred or impotence. It was occasionally used to predict the identity of future spouses and help or impede conception of a child. Medieval magic has been studied by historians for some time, but is a burgeoning field of investigation for archaeologists.

Considering that the *Malleus Maleficarum*, the 15th-century treatise on witchcraft, states that love magic was the most common form of witchcraft, where is the archaeological evidence for it? In this paper I consider this question by reflecting on a type of material culture that has been largely ignored by archaeologists – later medieval badges depicting sexual body-parts and scenes. These lead-alloy badges have been found across Northern and Western Europe, but are especially prevalent in the Low Countries. They are variably labelled as sexual, erotic, profane, obscene, satirical, bawdy or secular. Although studied by art historians, folklorists and some archaeologists, the purpose of these badges is still debated. This is in stark contrast to the study of pilgrim badges which have benefited from extensive and comprehensive study. Analysis of these so-called profane or erotic badges has focused on their iconography with little consideration given to how (and why) these badges may have been worn and used by medieval people. Were they just rude badges intended to amuse? Or were they apotropaic/magical, protecting the wearer from harm, or maybe a good-luck charm for a happy and fertile relationship? I argue that an archaeological approach that considers the context of their use and deposition, as well as reflecting on their iconographic connotations, may provide further understanding.

03 **RELIGION FOR EVERYDAY LIVES. SMALL FINDS AND LIVED RELIGION IN LATE MEDIEVAL SWEDEN**

Author(s): Regner, Elisabet (National Historical Museums)

Presentation Format: Oral

While it is common in medieval archaeology to state that religion was an integral part of medieval life, small finds are often categorized as for instance indicative of "trade", "crafts", "personal possessions" and "religion and folk belief" which gives the impression that for many practicing archaeologists, religion is in fact seen as quite separate from other parts of day-to-day living. Personal, private and domestic devotional practices formed a large part of late medieval religious life; however, they have received less scholarly attention than other aspects of medieval religion. This paper will take as its starting point that religion was of primary importance for structuring all aspects of medieval life. Instead of looking at religious institutions, this study looks at religion as it is lived and practiced, as a changing and sometimes contradictory amalgam of beliefs and practices that are not necessarily considered important by religious institutions. This paper will present case-studies based on a survey of archaeological finds of devotional objects, such as images of Saints and rosaries, with the aim of exploring regional, cultural or even individual differences in religious and ritual practices. Most of these finds are from urban contexts. The paper will attempt to embrace the fluidity of everyday beliefs, and explore the materiality of the devotional objects as well as the hybridity of ritual practices evident from archaeological finds contexts. The study is cross-disciplinary, and uses theoretical concepts from art-history, anthropology and sociology to interpret medieval finds and their archaeological contexts.

04 MEDIEVAL SMALL FINDS, RELIGIOUS PRACTICE AND EVERYDAY LIFE

Author(s): Søvsø, Mette (Sydvestjyske Museer)

Presentation Format: Oral

This paper will focus on the small finds potential as source to religious life and beliefs in medieval everyday life in Denmark. Despite the fact that religion was omnipresent in the medieval society we do not have many primary sources in Denmark to the broader populations religious life and practice. For the same reason this has not been subject to much interest or research among Danish archaeologists although material culture, especially small finds contains information on the subject. A growing number of detecting finds from the period together with artefact finds from mainly excavations in medieval town layers can help us to shed some light over how religious practice manifested in everyday life. The small finds presented here are personal belongings or accessories mainly in the shape of jewellery, amulets, pilgrim badges and other devotional objects or souvenirs. The papers starting point is finds from Denmark, especially Ribe and southwest Jutland. It will focus on how style and use of symbols of religious accessories changed through the period and also how decoration and shape of the objects shows not purely Christian symbolism, but also contains elements from folklore beliefs and other traditions as a reflection of the belief in the inherent power of things.

05 SMALL LUMPS OF LEAD - FINDS OF LEAD AMULETS IN DENMARK

Author(s): Imer, Lisbeth (National Museum of Denmark)

Presentation Format: Oral

As a consequence of a liberal legislation concerning the private use of metal detectors in Denmark, a little known find group of lead amulets has turned up in recent years. A lead amulet usually looks like a small lump of lead, which seems to have no antiquarian interest and few have been found in archaeological excavations. But because of a concentrated attention on communication with metal detectorists, the number of finds has increased immensely during the last couple of decades. This has resulted in a series of apotropaic texts carved on lead with either runes or Roman letters. The texts unfold a world of Christian benedictions and/or evil beings; demons, elves, trolls, giants, and names of unidentified creatures. Some of these are presumably representatives of specific illnesses of which we know very little, and some are interpreted as powers of evil that should be kept away from the owner of the amulet with the aid of divine powers. The tradition of wearing textual amulets is a pan-European phenomenon, and a variety of materials could be used; lead, wood, parchment, paper etc. The paper will present an overview of the Danish finds and focus on how the amulets were made, who made them, and how they were used.

06 SMALL FINDS EXPRESS RELIGIOUS BELIEFS

Author(s): Witte, Frauke (Museum Sønderjylland)

Presentation Format: Oral

It is extremely rare that archaeological excavations of rural medieval settlements provide insights into the thoughts and feelings of the people who lived there. However, during the excavation of a farm in the village of Nr. Bjert in southern Denmark a number of small finds may be interpreted as evidence of the religious beliefs of the owners – an area of life which does not normally leave archaeological traces within settlement contexts. The objects were found during the excavation of a farm house and of culture layers on the toft. Many different types of objects dating to the Medieval Period and the Renaissance were found. Some of these objects – two small lead crosses and an Ave Maria brooch as well as two pipkins buried under the hearth – reveal to us the range of religious beliefs in the Medieval Period. The finds may be understood within different contexts but they all on the one hand express an individual's specific religious beliefs while on the other hand they are part of an established regional way of showing religious beliefs whether or not this way was invisible to the surroundings.

In her presentation, Lisbeth Imer (National Museum of Copenhagen) argues that the two rare lead crosses are part of an established way of practicing one's faith although they were probably not on public display. This paper presents the contexts of the finds and discusses the differences in religious beliefs which are indicated by the small finds.

07 LIMOGES ENAMELS FOUND IN ENGLAND

Author(s): Lewis, Michael (British Museum; Portable Antiquities Scheme)

Presentation Format: Oral

Over the past 20 years some 300 Limoges enamels have been found by metal-detector users in England and Wales; all have been reported to (and recorded) by the Portable Antiquities Scheme. Such objects are invariably copper-alloy and their distinct enamelling survives in varying degrees of preservation. Most are religious items, such as from processional crosses, caskets and reliquaries, but others are dress accessories which might be considered secular. Most (especially the religious items) are elements of larger objects that have, somehow, been broken up in antiquity, and consequently ended up in the plough-soil where they have been recovered by detectorists. Many show signs of distress, which is an interesting facet of their 'object biography'.

This paper considers the loss of Limoges enamels in the context of the Protestant Reformation of the mid-16th century, when numerous low value religious objects seem to have been broken up and discarded; this contrasts to objects of intrinsic value, which are more likely to have been sold and exported to continental Europe. As part of this study, Limoges enamels will be surveyed in the wider historic landscape. Here will be considered their spatial distribution in relation to one another and also, in particular, their relationship

with local parish churches of medieval date.

08 'SMALL THINGS FORGOTTEN': COMMUNITY ARCHAEOLOGY IN A HIGH MEDIEVAL CEMETERY OF GALICIA (SPAIN)

Author(s): Ayán, Xurxo (Independent Researcher) - Gago García-Brabo, Xosé (Independent researcher)

Presentation Format: Oral

The hillfort of San Lourenzo (Cereixa, A Pobra do Brollón, Lugo, Galicia, Spain) is a Roman settlement that was Christianized in the High Middle Ages. It is located at the foot of one of the main pilgrimage routes to Santiago de Compostela. This site is fundamental to understand the genesis of the cultural landscape of this area of the northwest of the Iberian Peninsula. The region is known as the 'Ribeira Sacra', due to the large number of hermitages, churches and monasteries that were built during the Early Middle Ages. Since 2016 our team has been carrying out archaeological excavations in close collaboration with the local community. This research has allowed to register an old church and an early medieval necropolis. These remains are being studied in the framework of an international project on Catholic pilgrimage in Medieval Spain by the Max Planck Institute for the Science of Human History. Also the project has the support of the High Council for Scientific Research and the University of Basque Country. The tombs and the small objects exhumed in them are the material support of an ambitious program of Heritage socialization. We will show here all this dissemination work and how this unearthed past is being assumed by the neighbors of the parish of Cereixa.

09 THE CHARACTERISATION OF MONASTIC ARTEFACTS AND POTENTIAL FOR APPLYING A SPATIAL APPROACH TO THEIR STUDY: RELIGIOUS HOUSES IN GREATER LONDON

Author(s): March, Eleanor (University of York)

Presentation Format: Oral

Monasteries were an integral part of medieval society and life. They have a long history of academic interest; however, studies have typically focused upon their buildings, landscapes and historical documents to recreate monastic life, neglecting artefacts. Where artefact studies have been conducted they have commonly adopted a functionalist approach and their discussion relegated to specialist appendices with little detailed consideration of their relationship with specific people and/or activities. Similarly, spatial analysis of monasteries has traditionally overlooked artefacts, instead, relying upon architectural remains and/or documentary evidence, employing nomenclature with established, functional connotations which is in danger of presenting an idealised portrayal of monasticism.

In this contribution artefacts are presented as providing a tangible link to the past, offering an important insight into the creation and experience of social worlds. It is argued that adopting a spatial approach to monastic artefacts has the potential to further our understanding of lived experience within monasteries, challenging traditional perceptions concerning use of, and engagement with, monastic space. Data has been drawn from religious houses in Greater London where modern excavations have given equal importance to the recording and publication of artefacts as to monastic plans.

Fifteen object categories are identified, with objects classified according to function and/or activity and historical evidence employed to further consider their relationship with individuals and social groups. Focusing upon a case study of Augustinian sites, the spatial distribution of artefacts is then analysed to explore the delineation of monastic space, highlighting potential differences due to site location, gender and/or religious order. Influenced by approaches from other fields of archaeology, including Roman archaeology, sensory archaeology and parish church studies, this paper develops new methodologies for exploring medieval monasteries, emphasising how an holistic approach to artefacts can further our interpretation and understanding of medieval monasticism.

10 SMALL FINDS IN THE WASTE LAYERS OF THE MEDIEVAL MONASTERY IN RAUMA, FINLAND

Author(s): Helamaa, Maija (Muuritutkimus ky)

Presentation Format: Oral

Recent rescue excavations in Rauma, Southwestern Finland, took place near the church on the fringe of the medieval town. The Church of the Holy Cross, still in use as the town church, was originally part of the Franciscan convent which was in use from the 1440s to 1538. The exact location of the monastery itself, however, has been considered unknown.

The excavations in autumn 2017 give the archaeological evidence on the whereabouts of the monastery. Although no buildings were found, rich waste layers dated to the medieval period were excavated. The layers contained a somewhat surprising combination of animal bone waste and a large collection of small finds, for example coins and various types of metal objects as well as other materials.

The case study mainly focuses on different aspects of the metal objects discovered. How can the composition of finds be related to ecclesiastical activities and what does the material tell us about the monastery? Does the material reflect the site's transition from monastery to royal manor? Why are there so many rare and expensive objects in the layers which clearly have been formed of discarded waste? And why and when did they become valueless items to be thrown away? These questions will be studied mainly through comparative archaeological material and historical sources.

11 SMALL ITEMS FROM THE NOVODEVICHYIY (FEMALE) CONVENT: UPSCALE GOODS AND THEIR OWNERS IN THE EARLY MODERN PERIOD IN RUSSIA

Author(s): Grigorian, Svetlana (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

The Novodevichiy convent was founded at the end of the first quarter of the 16th c. as an asylum for females from the families related to the Czar court. It kept its court function up to the end of the 17th c.

The convent was situated behind the urban fringes and was surrounded by its own large industrial settlement, sloboda. The architectural assemblage of the convent has been well preserved up to the present. The excavations started only in 2000-s. The significant collection of small and unusual finds, which provide a glimpse of the inhabitants of the convent and its sloboda as a very extraordinary and not typical for Moscow, was managed to gather.

These are the items of personal pietism and simple life objects among which some imports or the replicas of the eastern imports – a lock of the 16th c. in a shape of animal, and the western imports, the pendant crosses of Central European iconography version of the second half of the 17th c. Another peculiarity of the convent finds is the constant letter graffiti on the ceramic vessels, likely, of owners.

These materials are correlated with big events from Russian history. The appearance of the eastern items probably reflects the contacts with Kazan Khanate, the Horde nobility coming to Moscow to serve and the following conquest of Kazan with the families' move. Eastern European crosses are likely produced in Moscow although according to the western makes point to the contribution to the links between Moscow and the West of some thousands orthodox families moved from the Polish-Lithuanian Commonwealth in the middle of the 17th c. especially from the territories of modern Belarus and Lithuania. Among them there are orthodox convents whose communities were situated in Moscow religious houses and first and foremost in Novodevichiy convent.

12 INTERPRETING MEDIEVAL DRESS ACCESSORIES FROM CENTRAL EUROPE

Author(s): Sawicki, Jakub (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic)

Presentation Format: Oral

Medieval dress accessories (buckles, brooches, belt mounts, strap ends, dress fasteners, temple rings, finger rings etc.) are usually neglected archaeological finds. However, it's worth to note that they are usually the only preserved, archaeological evidence of fashion. Moreover, this category of artefacts is strongly related to the way how humans function in the society and to their strategies of manifesting identity, status, goals and aspirations.

In this paper I would like to discuss the possibilities of interpreting those type of objects from Central European medieval cities, with a special focus on Prague (Czech Republic) and Wroclaw (Po-land). I will focus on problems of interpreting dress accessories at different scale perspective (Harris, 2017) and using different methods. I would like to discuss how new (at least in archaeology) methods of analyses and thinking about the past, such as Actor-Network Theory (Latour, 2005), Assemblage Theory (De Landa, 2016) or generally speaking 'relational archaeology' approach (Jervis, 2014), can benefit such studies, to hopefully get better understanding how activities reflected in material culture are also visible in consumption patterns and the social life.

De Landa, M., 2016. *Assemblage theory, Speculative realism*. Edinburgh University Press, Edinburgh.

Harris, O.J.T., 2017. *Assemblages and Scale in Archaeology*. *Camb. Archaeol. J.* 27, 127-139. <https://doi.org/10.1017/S0959774316000597>

Jervis, B., 2014. *Pottery and Social Life in Medieval England*. Oxbow Books.

Latour, B., 2005. *Reassembling the social: an introduction to actor-network-theory*, Clarendon lectures in management studies. Oxford University Press, Oxford ; New York. studies.

13 4000 PENDANTS STUDIED AND 4(000) LESSONS LEARNED

Author(s): Kurisoo, Tuuli (Centre for Baltic and Scandinavian Archaeology; University of Kiel)

Presentation Format: Oral

This paper concentrates on some of the aspects of my PhD thesis on 10th–13th century pendants in the north-eastern Baltic Sea region. These centuries mark the end of the prehistoric period in Estonia and Latvia, but the topic is of more general concern. The pendants include figurative and non-figurative specimens that were cast, wrought or carved, but also pendants made of skeletal elements and unmodified pieces of amber. In this presentation, four components of research strategy that helped to comprehend such vast and diverse source material will be discussed. The large quantity of archaeological small finds is somewhat deterring and deciding what amount of material can be regarded as 'critical mass' of data is crucial. Also the importance of definition, even when the subject is intuitively understood, cannot be underestimated. Some thoughts are given to different approaches on sorting, whereas flexible and open classification is considered more advantageous than formal typology. Pendants are symbolically loaded objects which influences research: there is a tendency to overexploit meanings, where other aspects are under-discussed or only selectively studied. One way towards more balanced narratives is to put more emphasis on contextual analysis, but of equal importance is to see these small finds as a part of wider system, for instance, as components of visual culture.

14 CONTEXTUALIZING LATE MEDIEVAL BELT FITTINGS

Author(s): Kars, Mirjam (VU Amsterdam; Portable Antiquities of the Netherlands - PAN)

Presentation Format: Oral

The archaeology of the later Medieval period has always been less embedded in an academic environment than the archaeology of the Early Medieval period for which, as a consequence, the interpretations of material remnants are now firmly rooted in ongoing theoretical discussions. This paper addresses the question whether these discussions can be of any use for the later Medieval period, or that other solutions are required.

The entire group of Late Medieval belt fittings, from common to exceptional ones, serves as a case study in this paper. The focus is especially on the theoretical concept of 'materiality' and how it engages with Late Medieval belt fittings, since it has proven to add insights to the analysis of Early Medieval belt fittings. This concept was also chosen because it can help to understand how objects entered society and functioned therein. The interaction between the organization of production, the (wide spread) appropriation of objects and their attached meanings, and the societal context in which this all happened are all aspects of the materiality concept that need to be discussed in order to reach such an understanding.

The case study mainly deals with the in PAN (Portable Antiquities of the Netherlands) established typology and recorded belt fittings, but also with finds published elsewhere. The discussed materiality of the fittings shows that classifications other than those based on predominantly morphological criteria can provide additional insights.

Altogether, the paper aims at demonstrating how traditional typologies combined with more theoretical based approaches to material culture can contextualize both common and exceptional objects, which has not only an academic value but also offers stories for the wider public.

15 SOUTH-EASTWARD PENETRATION OF THE "WESTERN FASHION" IN THE LATE MIDDLE AGES: ANNULAR BROOCHES FOUND IN CROATIA AND NEIGHBOURING COUNTRIES

Author(s): Belaj, Juraj (The Institute of Archaeology, Zagreb)

Presentation Format: Oral

Annular brooches are a class of objects similar to buckles, consisting of a frame of various shapes and a revolving pin, whose bed is defined in a certain way. Originally they served for fastening clothes on the chest below the neck or on one or both shoulders. However, their positions in certain graves suggest that they may have been used in different ways.

The observed area has yielded round annular brooches with a wide and straight frame with hexagonal and semi-circular cross-sections; rhombic, six-foiled, six-pointed brooches; brooches with six-pointed frame whose arms were double connected; eight-pointed, cordate and zoomorphic brooches.

This presentation will show the distribution of individual types of annular brooches in Croatia and the neighbouring countries (Hungary, Serbia, Bosnia and Herzegovina, Montenegro and Slovenia), based on the published material.

The obtained picture will demonstrate that there are big differences in the distribution of annular brooches in general, as well as in some of their types in the observed area. The different level of research and publication of material is not the only reason for this situation.

What can we conclude from this about the directions and mechanisms of the spread of this fashion from Western and Southern Europe towards south-east? We can observe that older specimens, found in hoards from the time of the Mongol invasion, were made of more expensive materials, which were later followed by cheaper imitations. Who were the agents behind the spread of this fashion? May we think of itinerant craftsmen and local workshops? What could have caused different degrees of acceptance of individual types of annular brooches in different areas, but also the different practices of their wear, meaning, the different functions that were attributed to them? These are the questions to which this presentation will try to give answers.

16 EVERYTHING COUNTS (FOR GILDED MOUNTS)

Author(s): Webley, Robert (University of York; The British Museum)

Presentation Format: Oral

A particular type of gilded copper-alloy mount, known in England as the 'binding strip', has long been recognised as a standard object type of the 12th and 13th centuries. Since the 1950s, they have come to be associated with high status sites in England such as castles and manors, with examples also known from German castle sites. However, studies in England have stalled while we still debate their function(s).

This paper will use the latest data to advance our knowledge of binding strips, presenting examples from across North West Europe for the first time to an international audience. It will highlight these mounts' perplexingly variable national historiographies, which have served to hamper data collation at the European level.

Thanks to recent collaboration between continental colleagues, new work suggests that the enigmatically titled 'octopus mount' might provide a focal point around which our knowledge of binding strips can be reconfigured. With a new sense of the function of binding strips, art historical evidence will be brought to bear, alongside a vastly expanded dataset of artefacts, to re-explore the received wisdom regarding their dating and social associations. In turn, we will explore their role in reflecting and creating social

hierarchy, as well as consider their demise from the 13th century onwards.

17 GRAVE GOODS IN EARLY MEDIEVAL BURIALS FROM LESSER POLAND

Author(s): Kubica-Grygiel, Anna (Institute of Archaeology Jagiellonian University)

Presentation Format: Oral

Objects found in graves have always been a traditional focus of burial archaeology. Conventional interpretations of their meanings have always suggested a religious dimension, where presence of the grave goods, especially objects of everyday use, was interpreted as a 'pagan' custom. While analysing presence of different grave goods we can also examine social status of the deceased and see if there was a visible difference between age groups in terms of wealth or specific categories of objects given to the grave. Other interesting result provide association of particular grave goods with sex of the deceased which can show whether specific group of object was strictly reserved for men, women or children. Particularly interesting in terms of funeral custom are especially children's graves as it is not possible to determine their sex using classic anthropology methods. By comparing numerous information from archaeological data we can determine whether model of funeral equipment was more similar to this observed in men's or women's graves.

Such studies can only be reliable if we are in possession of both numerous archaeological and anthropological data from a variety of cemeteries.

The aim of this presentation is to examine the rules of funeral rite in the Early Medieval Lesser Poland according to detailed analysis of funeral units compared with information from anthropological analysis. Comparison of over 140 funeral sites with more than 1000 individuals will shed a new light on funerary custom of the Early Medieval populations living in the territory of present south-east Poland.

18 LOOK AFTER THE PENNIES... PIGGYBANKS IN THE MIDDLE AGES

Author(s): Romanowicz, Paulina (Institute of Archaeology and Ethnology Polish Academy of Sciences)

Presentation Format: Oral

Ceramic piggybanks are one of the items found often especially during excavation research in the cities, but not only. They usually take the form of a simple conical containers or nowadays associated with this form of activity animal pig figurines. Connected these days with the children's savings exercise, they are quite often treated as a children's quasi-toy also in relation to the medieval times. However, this interpretation seems too hasty and inaccurate. There are arguments for the fact that the medieval ceramic piggybanks were a completely "adult" objects and attributes of thriftiness. For the medieval reality, assigning children to savings seems to be a bit preposterous. In my poster I intend to show various forms of this category of objects found in the region of northern Europe, and try to answer the question: were these, in fact, objects of children's play or an adult economic sense. I want to consider what was the social meaning of thriftiness in the Middle Ages and how those finds are related to this activity. Is this just some rare example of unusual behavior or is it normal and popular mental state of mind in high medieval society. Last but not least I want to reflect on which social groups seem to be more likely to use those piggybanks.

19 LONELY GAME PIECE. SINGULAR FINDINGS OF MEDIEVAL GAME PIECES AND GAMBLING UTENSILS AND THEIR STATUS IN ARCHAEOLOGICAL STUDIES

Author(s): Wielocha, Ewa (Institute of Archaeology, Nicolaus Copernicus University in Toruń)

Presentation Format: Oral

Findings often interpreted as medieval game pieces or gambling utensils are known from numerous archaeological sites located not only in and around medieval towns, cities and castles, but also cloisters, churches and cemeteries. Those small objects present a variety of shapes, sizes and materials they are made of. Among them there are flat discs, square tiles, square-based pyramids, balls and half-balls, bell-shaped and conical pieces, and finally, miniature figures; some of them are plain, some have various markings, dots and lines, some have small drilled holes. They are made not only of bone, antler, wood or stone, but also of glass, metal or even leather, and the quality of their making varies on different levels.

Findings of gaming or gambling pieces are often considered chronologically unsensitive, as in many cases they can be dated from medieval to modern or even almost contemporary times. Also, it is not uncommon to find only a single example of object from this category on the entire archaeological site, which can be another reason why some archaeologists aren't interested in investigating form, context and function of similar findings more closely.

The following poster presents a few reflections on the topic of singular findings of medieval game pieces and their status in archaeological studies. It appears that recognising them as useful archaeological materials can be a challenge - a challenge that forces us to re-think our major assumptions about what those objects are and what they could be used for.

20 EXPLORING URBAN IDENTITIES THROUGH MEDIEVAL SMALL FINDS

Author(s): Kjellberg, Joakim (Department of Archaeology and Ancient History)

Presentation Format: Oral

This presentation will showcase and discuss some results from a comparative study of urban identities in artefact assemblages from households in the medieval town of Uppsala, Sweden. It also considers the methodological challenges in interpreting the relationship between artefacts and individuals in an urban context with a particular focus on small finds and personal objects.

Scandinavian medieval archaeology has been strongly influenced by the concept of urban identity for the last 20 years. The presumption is that the material culture of towns expresses a shared urban identity due to differences in the material repertoires of some urban and rural households. Still the concept has rarely been the focus for comprehensive, empirical and comparative analysis of artefact materials. The works referencing urban identity have mostly been focused on single sites and single artefact categories such as ceramics.

The artefact assemblage from 12 excavations with phases dating from the 12th to the 16th centuries were analyzed using correspondence analysis of several object- and material categories. The material is signifying differentiated clusters of material culture and that identity in the medieval town was more diverse than simply "urban". Difference between households with and without women and children are especially apparent. Other markers of social status, personal and ethnic identity have also been identified. This paper argues that a multifaceted approach to artefacts and social identity is needed in future studies.

21 LOCKS AND KEYS FROM THE MEDIEVAL RURAL SETTLEMENTS OF THE NORTH-EASTERN RUS': THE IDEA OF WELFARE

Author(s): Fedorina, Anastasia (IA RAS)

Presentation Format: Oral

Long-term field investigations at the rural settlements of Suzdal Opolye have produced extensive collections of metal objects from the surface surveys (more than 11000 items from 340 sites). Potential of this data as the source material for the insight into the Viking age and Medieval settlement dynamics, subsistence and social organization was recently demonstrated in a number of research.

Locks and keys represent an important though underestimated part of this collection. It includes more than 400 items from 86 dwelling sites of the 10th–15th cc. Preservation of many locks is not sufficient for their typological attribution. The keys are mostly well preserved. They belong to the standard types with reliable chronological attribution. Though the cultural layers of settlements in Suzdal region are strongly disturbed by plowing, distribution of the artifacts reveals the dynamics of the use of these utensils.

Locks and keys at the Viking age and Medieval sites are often regarded as markers of wealth and high social status. The paper focuses on their artistic quality, especially on the group of artifacts with bronze-inlayed and stamped decoration and quaint key handle. Their chronological distribution proves that the keys and locks were important symbols of wealth at the early period: complicated decorations and designs are more typical for the keys of the 10th – the early 12th cc.

The finds of keys and locks provide extra evidence for the reconstruction of settlements structure with the lack of visual signs. They contribute to the research of the settlement system and welfare. For the early period of the ancient Rus' colonization, mainly large settlements or smaller ones with prestigious finds produce keys and locks. Since the 12th c., the geography of such finds becomes wider and shows more items per site. But such finds tend to concentrate at historical settlements of Opolye.

22 NEGOTIATING SOCIAL IDENTITY IN A MEDIEVAL URBAN ENVIRONMENT

Author(s): Nordström, Annika (Dept of Archaeology and Ancient History, Uppsala Univ)

Presentation Format: Oral

During the last two decades, there has been a significant change in Scandinavian urban archaeology in terms of direction and perspective. The research has turned towards a wider regional and international time-space perspective and issues regarding everyday life, the individual, identity and gender are increasingly discussed. In this paper I will give a few examples of how different types of material culture, perhaps not commonly considered, can be used to understand aspects of social identity, mainly in regards to age, gender and class, on a group of traditionally voiceless actors – the ordinary townspeople. I will also argue that the examples may serve as a basis of discussion for the concept of becoming urban, how ordinary people used the opportunity of a new setting to negotiate the "urban way of life".

In my PhD project I study how a Swedish medieval town (Nyköping), developed to become a living urban community, in regards to different functions, activities, inhabitants and visitors, and how this changes over time (c. 1100 – 1500 AD). In my ongoing research, I have a multidisciplinary approach including for example written sources, archaeobotanical remains and traditional material culture, applying social practice theory and studies on social identity. The examples presented in this paper is part of that research.

23 KSAR SEGHIR, A NORTH AFRICAN TOWN DISCOVERED THROUGH SMALL FINDS

Author(s): Teixeira, Andre (FCSH/NOVA) - Torres, Joana (CHAM - Centre for the Humanities) - Bargão, André (CHAM - Centre for the Humanities)

Presentation Format: Oral

Ksar Seghir is a Moroccan archaeological site located in the South bank of the Strait of Gibraltar, between the cities of Tangier and Ceuta. This town was abandoned by the Portuguese in 1550, after almost 100 years of political and territorial domain. Since then, this burgh was no longer occupied remaining unknown until the major archaeological interventions of Charles L. Redman and his team during the decades of 1970 and 1980.

Their extensive and consistent work allowed the discovery of two main occupation moments: one that testified the last phase of the Portuguese presence, and another that attested a previous medieval Islamic settlement, revealing some of their most monumental buildings, public facilities, housing, production and commercial structures, aside an incredible set of medieval and early modern everyday objects.

Despite the interesting and innovative work produced by C. L. Redman's team of researchers, there is still a lot of material that needs more investigation and mostly new approaches. This presentation intends to present a set of small finds from various archaeological soundings in the stratigraphic context of the Portuguese occupation of Ksar Seghir (or Alcácer Ceguer) between 1458 and 1550. In this case, despite the ground-breaking research of James L. Boone, where he also addresses the significance of small finds in the framework of the Portuguese occupation, we aim to give a simultaneously global and detailed study on the so-called small remains.

Here we include objects with different compositions, such as wood, bone, glass and various metal alloys, in an attempt to diversify and potentiate the information they can give us on Ksar Seghir material culture and daily-life history. Thus, we will be looking into these objects with some problematics in mind, like socioeconomic hierarchies, professional and military features, commercial contacts, gender, taste, religiosity, and mentalities traces.

24 APPROACHING TO VERDÚ BLACK POTTERY: THE CASE OF SALISI'S KILN

Author(s): Coso Alvarez, Júlia - Peix Visiedo, Judith (Universitat de Barcelona; Cultura Material i Arqueometria UB - ARQUB, GRACPE) - Cardona Colell, Ramón (Secció d'Arqueologia del Centre d'Estudis Lacetans - CEL) - Salisi Clos, Josep M (Universitat Autònoma de Barcelona)

Presentation Format: Oral

The study of Salisi's kiln, is related with the production of pottery in Verdú, a Catalanian town mainly well-known because of its fact. Furthermore, the kiln is involved in a problematic case related with "black pottery", a kind of ceramic whose beginnings is unknown. Nevertheless, we assume that black pottery was already produced in Verdú at the end of the XVth century. For this reason, and thanks to the historical resources, it is believed that this kiln could have been one of the oldest in this area.

The present study has the goal to invest in innovative approaches of the use and the amortization of the kiln, based on its materials, such as glazed pottery, coarse ware, kiln supports and pitchers among them. We are focusing especially in the study of the latest, with the willingness to create a typology, and moreover, to attribute a trustworthy dating. The use of pitchers, in contrast with glazed pottery, was mainly used in all the hierarchical statements, and was specially spread among the popular classes. Therefore, this study allows us to obtain influential information from the daily life of popular statements. Otherwise, the study of kiln supports has been decisive to understand the functioning of the kiln.

To do this, the study has been carried out with a statistical methodology after the traditional material classification, that could allow us to link the kiln, with their background, and what is more important, with the historic landscape. The creation of a pitcher typology, studying the different shapes and forms: bases, spouts, rims; is a property study that let us to have a better cultural acknowledge from this period.

096 FORUM MEDIEVAL ARCHAEOLOGY (MERC): THE MEDITERRANEAN AS CONNECTION AND GATEWAY IN THE MIDDLE AGES

Theme: Mediterranean seascapes

Organisers: Tys, Dries (VUB; MERC) - Pluskowski, Alex (Reading University; MERC) - Fleming, Robin (Boston College; MERC) - Hansen, Gitte (Bergen University; MERC)

Format: MERC Forum and round table.

In our annual medieval forum, we want to discuss how the mediterranean provided also in the Middle Ages a connection between North Africa and South Europe. The connection was very dynamic and provided a permanent interaction. Two or Three key-notes and shorter statements by young researchers will introduce the discussion. The medieval Forum is not only concerned with the scientific debate about the past, but also wants to explore research issues, agenda's and more in medieval archaeology for the future.

01 THE MIGRATION AND COLONISATION OF BERBER AND ARAB CLAN GROUPS IN THE BALEARIC ISLANDS (10TH -13TH CENTURY)

Author(s): Kirchner, Helena (Dept.Ciències de l'Antiguitat i de l'Edat Mitjana, Facultat de Lletres)

Presentation Format: Oral

The arrival of Berber and Arabic clans in the Balearic Islands from the 902 AD onwards led to the emergence of new kinds of settlements and agricultural areas. There is evidence for earlier Muslim expeditions and also for the pacts that these expeditionaries made with local population, but there is no trace of stable settlement until AD 902, when the occupation of the islands formally began. The scant archaeological evidence from the 8th and 9th centuries is a common feature of the three islands and it is not yet possible to describe the form of the settlement pattern at this time. Although the sources only mention the island of Majorca and barely Menorca, the immigration of tribal groups from šarq al-Andalus (eastern part of al-Andalus) took place on the three islands. The paper will synthesise the knowledge we have on the archaeological record, the place names distribution and written evidence left by this process. The research done on agricultural areas (irrigated, dry farming and drained) will be highlighted. The homogeneity in the settlement patterns and the technology that was employed to transform the rural landscape indicates that the colonisation was completed in a brief period of time. The skills and knowledge required to colonise would have been acquired in mainland al-Andalus before the conquest of AD 902.

02 KEYNOTE: FORGOTTEN AFRICA AND THE MEDIEVAL MEDITERRANEAN

Author(s): Fenwick, Corisande (UCL)

Presentation Format: Oral

Islamic North Africa poses a problem to medievalists. Both Mediterranean and Saharan (and everything between), it was the gateway to Europe and the Middle East for gold, slaves and precious items from sub-Saharan Africa. But as in antiquity, the medieval Maghreb was also a rich region in its own right, wealthy in olive oil, grain and livestock. This wealth in trade and agriculture underwrote a golden age for North Africa's cities - but it also underpinned the dominance of Maghrebi states and empires in the medieval Mediterranean. Throughout the middle ages, North African armies repeatedly raided and sometimes conquered and settled in Iberia, Sicily and the western Mediterranean islands. And yet, the intense and complex relationships between North Africa and southern Europe seldom feature in standard historical and archaeological accounts of medieval Europe or the early Islamic world.

This keynote paper thus examines connections between the Maghreb, Al-Andalus and Sicily from the vantage point of the Mediterranean's southern shore. It draws on a wealth of new archaeological and historical research from the past three decades to challenge old, but still powerful, models of Islamic North Africa as an under-developed periphery and to show why a North African perspective matters in the debates about the impact of Muslim rule, the spread of Islam and trade and exchange in the medieval Mediterranean.

101 UNDERSTANDING ACTIVITY PATTERNS OF ANIMALS: METHODS, APPLICATIONS, AND HUMAN-ANIMAL RELATIONSHIPS

Theme: Theories and methods in archaeological sciences

Organisers: Salmi, Anna-Kaisa (University of Oulu) - Niinimäki, Sirpa (University of Oulu) - Henderson, Charlotte (University of Coimbra)

Format: Regular session

Physical activity reconstruction through skeletal markers has been used to examine human activity patterns for a long time. For animals, skeletal changes such as pathological lesions, enthesal changes, bone cross-sections, and stable isotope analysis can similarly be used to assess physical activity and mobility patterns. Animal activity patterns are useful for multiple purposes, including analysis of animal management practices, transhumance, identification of working animals, and animal domestication. Analysis of activity patterns also plays a crucial part in the construction of osteobiographies of animals. Moreover, the recent 'animal turn' in social sciences as well as the growing body of archaeological studies on people's engagements with animals have created a heightened need for methodologies suitable for the identification of the various activities animals performed with and without their human companions. This session focuses on the reconstruction of physical activity of animals from different perspectives. We welcome papers focused on methodological advances in animal activity assessment, as well as case studies and papers discussing the relevance of such studies for understanding human-animal relationships and animal agency in past societies.

01 WORKING WITH REINDEER - HUMAN-REINDEER RELATIONSHIPS AND REINDEER ACTIVITY PATTERNS

Author(s): Salmi, Anna-Kaisa (University of Oulu)

Presentation Format: Oral

Animals are not just resources such as food, hides and furs, or vehicles for symbolical meanings. They are also companions, collaborators, and significant others in webs of social interaction. In Northern Eurasia, the important significant other is often a reindeer. Humans influence reindeer activity patterns in several ways. Reindeer herding traditions vary, for instance, in terms of length of yearly migrations (or a lack of thereof), the degree of freedom the animals have, reindeer feeding practices, and the use of cargo, draught, and riding reindeer. The harness types and carrying devices have also varied in time and space.

This paper focusses on the relationships between people and working reindeer, especially among the Sámi of Northern Fennoscandia. Draught and cargo reindeer allowed the efficient movement of people and their belongings in the arctic landscape without roads. They also facilitated meetings and social ties between people. The use and training of a draught reindeer led to a close working relationship between human and animal persons. Working reindeer were companions to people in the daily tasks and the training of a reindeer individual for several years created a companionship between the reindeer and the trainer. This paper will sketch out some of the social and inter-species relationships that were involved in draught and cargo reindeer use. Doing that, I also hope to show how identification of animal activity patterns can help in understanding past cultural practices and human-animal relationships.

02 RECENT DEVELOPMENTS IN THE METHODS FOR PHYSICAL ACTIVITY ASSESSMENT OF REINDEER

Author(s): Niinimäki, Sirpa - Puolakka, Hanna - Salmi, Anna-Kaisa (University of Oulu)

Presentation Format: Oral

One potential method for studying human-animal relationship is via the associated effects on animal physical activity. In reindeer, human influence can be observed as changes in feeding behavior, i.e. when reindeer are fed, there is less need for the reindeer to engage in activities related to feeding, such as digging lichen from under the snow. Those reindeer willing to work and interact with humans have also been used to help in laborious tasks such as carrying and pulling loads, and, in some areas in Siberia, even for riding. Inter-individual variation among the reindeer in the amount of activity without human influence may differ; also regional variation in the required activity levels can vary according to snow cover and terrain relief. These factors have the potential to influence the levels of physical activity experienced by a reindeer. Recent developments in physical activity assessment of reindeer offer a possibility to identify these variations in reindeer activity in the archaeological record. This paper presents some of the recent developments in zooarchaeological methodology, such as the development of muscle attachment site scoring for reindeer, identification of working-related pathological lesions in reindeer skeletons, and the use of bone cross-sections in physical activity assessment of reindeer.

03 ENTHESEAL AND PATHOLOGICAL PECULIARITIES BETWEEN ECOTYPES OF RANGIFER TARANDUS

Author(s): Hull, Emily (University of Alberta)

Presentation Format: Oral

Rangifer tarandus, both wild and domestic, are a keystone species to the circumpolar world. Northern peoples have hunted, herded, milked, and ridden *Rangifer tarandus*, and have cast them in roles as diverse as prey and companion. While the exact number and delineation of subspecies is still a subject of debate, most experts agree that *Rangifer tarandus* can be divided into three broad ecotypes; large forest types, mid-sized tundra types, and small-bodied arctic types. Studies of modern reindeer and of archaeological materials reveal that, to date, only tundra reindeer are known to have been domesticated. Forest reindeer and tundra reindeer overlap in size and are difficult to distinguish in the archaeological record. The behavioral patterns and community dynamics of each of these groups may give additional clues to why tundra reindeer were more receptive to human involvement. By using traditional methods of osteology and identifying patterns of habitual activity, behavioral proclivity, and rates of specific injury and pathology among subspecies of *Rangifer tarandus*, we may both more accurately identify an archaeological individual's ecotype and add additional nuance to theories of reindeer domestication. This allows niche adaptations and landscapes themselves to be considered as additional agents in domestication. By considering the animals holistically, as individuals within communities who are adapted to and shaped by unique environments, we can more accurately identify and explore the differences between ecotypes in the archaeological record.

04 DEVELOPING A ZOOARCHAEOLOGICAL TOOL FOR UNDERSTANDING REINDEER MANAGEMENT STRATEGIES

Author(s): van den Berg, Mathilde - Çakırlar, Canan (University of Groningen)

Presentation Format: Oral

The culling patterns of animals can offer insight into past and contemporary human subsistence strategies. Trying to understand mortality patterns of reindeer specifically, is essential because reindeer are the most common and numerous species among Pleistocene archaeological bone assemblages, and human-reindeer relationships remain to be important over time. Also today subsist-

ence strategies related to reindeer remain to be traditional livelihoods that are carried out by many different ethnic indigenous Arctic peoples.

There are several techniques for the ageing of the wild or (semi-)domestic reindeer/caribou (*Rangifer tarandus*) that concern the teeth, which are a good portion for age-at-death estimation for various reasons. Though, the techniques that are available for reindeer are mostly either expensive, time-consuming, complicated, destructive, or have been proven inaccurate, or a combination of these.

The purpose of this project was to set out a visual, easy-to-use observation and recording scheme based on the dental ageing (i.e., tooth wear and eruption patterns) of reindeer on Edgeøya in particular, but which could be transferred to relative ages of other reindeer populations from both archaeological and modern assemblages. In this paper I discuss the development of this method, the testing, and finally the application of the scheme on several archaeological assemblages.

The scheme proves to be easy-to-use, non-destructive, cheap, fast, and generates accurate ageing data. This enhances the opportunities for examining the bio-cultural history of reindeer considerably, and opens up the possibility of generating large datasets that have the potential in understanding hunting and management practices and their change through time of both contemporary and prehistoric communities inhabiting the northern hemisphere.

05 DETECTING PLASTIC RESPONSE TO MOBILITY CONTROL: TOWARDS NEW MARKERS OF ANIMAL DOMESTICATION IN ARCHAEOLOGY

Author(s): Cucchi, Thomas (CNRS/Natural History Museum of Paris)

Presentation Format: Oral

The initial stage of the domestication process remains too elusive to be documented from the conventional domestication syndromes commonly used in zooarchaeology. These morphological syndromes mainly rely on genetically driven markers induced by adaptation and directional selection which document an ongoing but not an incipient process.

DOMEXP research project aims at detecting the plastic response of animal skeleton to captivity, in order to access morphological signatures of human induced changes in the biomechanic environment of animals. Such markers could then be applied to archaeological remains to get new insights into the early stages of the domestication process.

The plastic imprint of a captive biomechanical environment in the bone morphology was explored on an ungulate model: the wild boar. We combined two approaches: (1) We performed an experiment to test the effect of captivity over the skeleton development on individuals from the same population that grew in different levels of mobility reduction, (2) we compared the adult phenotypes from populations of different gene pools that lived in allochthonous environments (i.e. wild boars in captivity versus free ranging pigs) using modern and archaeological samples.

To capture the biomechanic signal of mobility control, we combined both 3D Geometric Morphometrics of bone surfaces and 3D morphometric mapping of the cortical thickness of long bones.

06 LOVE THE WAY YOU MOVE: TECHNICAL AND METHODOLOGICAL APPROXIMATIONS TO CATTLE MOBILITY AND USE DURING NEOLITHIC IN NE IBERIAN PENINSULA

Author(s): Gomez Bach, Anna (GRAMPO, UAB) - Ripoll Miralda, Joaquim - Saña Seguí, Maria - Yousef-Pouran, Kaveh (Laboratori d'Arqueozoologia, UAB) - Álvarez Arza, Ramón (Secció de Prehistòria i Arqueologia, UB) - Alcàntara Fors, Roger (Laboratori d'Arqueozoologia, GRAMPO, UAB) - Molist Montaña, Miquel (GRAMPO, UAB) - Rauret Dalmau, Anna Maria (Secció de Prehistòria i Arqueologia, UB)

Presentation Format: Oral

Establishing animal activity patterns is a key question to deepen in the study of animal domestication and initial husbandry practices. This aspect of animals' life has little archaeological visibility, as the current available related materials from the Neolithic are usually bones. The recovery and documentation of tools or implements linked to the use of animals as a labour force during these chronologies isn't by far, something common.

Nowadays, there are several available options to approach this matter although some of them are still in the experimental stage. Among these we can highlight analyses on stable isotopes, geometric morphometrics, biomechanics, bone microstructure or paleopathologies.

In this communication we present an integrated analysis of cattle using 3D geometric morphometrics on first and second phalanges, long bone cross-sections and osteon analysis. Activity levels, mobility and exploitation patterns will be evaluated on an exceptionally well-preserved sample of *Bos taurus* bone remains from Pixarelles cave, a middle Neolithic cave site located at NE Iberian peninsula.

We aim to contribute to our knowledge on cattle management strategies and economic role as well as to evaluate the possibilities and limitations of the methodological approaches applied.

Results support geometric morphometrics, long bone cross-sections and osteon analysis as efficient methods to study animal activity patterns and management strategies and highlights the need to perform integrated analysis to properly study animal activity patterns.

07 CATTLE HUSBANDRY AND HUMAN/ANIMAL RELATIONS IN THE BRONZE AGE - EXAMPLES FROM SOUTHERN DENMARK

Author(s): Matthes, Lilian (Museum Sønderjylland, Haderslev)

Presentation Format: Oral

Despite the general consensus about the importance of beef in the Bronze Age diet, many fundamental questions about the relationship between animals and humans, and about the treatment of cattle and the way, they were kept within the settlements are still unsolved. The relationship seems to have been complex. Did the Early Bronze Age longhouses indeed house cattle? Is this a common aspect, or is the "housing of cattle" an expression of a special relationship between some animals and their owners? Is this aspect fully investigated, or is possible to identify features which could be related to the handling of cattle in another way? In this paper, I will suggest the interpretation of cattle pens for certain features which have traditionally been interpreted as houses. The features could indicate a certain mobility of cattle, that contradicts the common concept of having cattle in the houses. Was pastoralism the common way of keeping and feeding cattle? How is this shown in the archaeological evidents- and is it possible to see trades of the pastoralism and the fodder used for cattle in other archaeological contexts as usually? A research project at the Danish Museum Sønderjylland investigated botanical material from cooking pits, which were interpreted as a gathering place, and it showed, that the relationship between settlements and local resources, the mobility and role of the cattle appears to have been much more complex than presumed.

08 ENTHESEAL CHANGES: A METHOD TO DETECT ACTIVITIES IN ARCHAEOLOGICAL HORSE SKELETONS

Author(s): Binde, Marion - Cochard, David - Knüsel, Christopher John (UMR 5199 PACEA, Université de Bordeaux)

Presentation Format: Oral

The discoveries of complete equid skeletons in funerary contexts attest to strong equid-human relationships over time. Horses were implicated in a diversity of functions as mounted, draft, or pack animals. If zooarchaeologists can confirm their domesticated status, they can only hypothesize about their real use.

This paper proposes a means to answer this question based on enthesal changes, defined as modifications of tendinous and ligamentous attachments on bones. The study of these alterations developed in biological anthropology over the last 30 years in order to reconstruct the socio-economic activities, life conditions, health status and division of labor in past human groups. However, despite the potential demonstrated by these research results, studies of enthesal changes in faunal remains are much less common.

Inspired by methods used for human remains, 23 appendicular equine entheses of the scapula, humerus, radio-ulna, os coxae, femur, tibia and phalanges were recorded macroscopically. Modern documented specimens were analysed to establish a reference baseline composed of wild (*Equus caballus przewalskii*, zebras) and domesticated equids (*Equus caballus*, *Equus asinus*, hybrids). Age, sex, body proportions and type of activities, which can influence the development of enthesal lesions, were tested.

This work provides an initial attempt to identify past equine activities from archaeological contexts.

09 SCALING WITH SIZE IN HORSES MAY HAVE IMPLICATIONS FOR RECONSTRUCTING ACTIVITY FROM ENTHESEAL CHANGES

Author(s): Niskanen, Markku (University of Oulu)

Presentation Format: Oral

Size and scaling (the relative change in dimensions with size) affects structural durability and locomotor ability of vertebrate animals through effects on weight-bearing skeletal support system and muscle-tendon mechanics. This study examines scaling with size in horses representing a large range in size and type from small ponies to large draft horses in light of osteometric dimensions focusing on the moment and load arm lengths of the ankle joint extensor muscles reconstructed from tarsal, metatarsal and phalangeal measurements. Results reveal that there is very little allometric scaling with size in this domestic species. For example, the moment arm length of the ankle extensors increases much less than predicted relative to their load arm length with size. Findings of this study are in an agreement with a study of pulling strength of draft horses, which shows that large horses are essentially isometrically scaled-up versions of small horses in respect to their ability to pull weight. Because the force output relative to body mass declines with size in horses, increasing size is associated with a compensatory increase in muscular effort. This largely isometric scaling with size may have implications for reconstructions of activities and/or workloads from enthesal changes. More enthesal change in large horses than in small horses is predicted.

10 ANIMAL ATTACHMENTS: NEW DIRECTIONS FOR INFERRING ACTIVITY BASED ON HUMAN ENTHESEAL CHANGES

Author(s): Henderson, Charlotte (CIAS - Research Centre for Anthropology and Health, Coimbra Portugal)

Presentation Format: Oral

Enthesal changes (ECs), i.e. the "abnormalities" seen at the sites of attachment of the tendon and other soft tissue attachments to the skeleton, have been widely used in human bioarchaeology to infer activity patterns. Their use has typically focussed on identifying differences in which muscles have been most used, which in combination with artefactual evidence is then used to reconstruct

activity-patterns and the division of labour. Recent research has called this approach into question. Using human skeletal remains with known sex, age-at-death and known occupation has shown that these inferences have been overly simplistic due to the strong association between increased age and an increase in EC. Ranking muscles by the presence of enthesal changes or their "severity" has also been called into question given that there is variability in the types of changes seen at entheses, for example cavitations are rarely seen outside the rotator cuff insertions. This is also supported by meta-analyses which have shown that some entheses, like the biceps brachii insertion have more EC than the supraspinatus. However, not all population samples follow this pattern: these differences highlight where enthesal change research can provide clues as to activities. They also show that there are general trends through time: with modern societies having the highest frequency of enthesal changes. By studying these general trends and improving our understanding of the aetiology of these changes, we can improve inferences about past activity-patterns. The aim of this presentation is to demonstrate the directions which both human and non-human animal studies should take to maximise the interpretation potential of enthesal changes for activity studies.

11 HORSE – HUMANE RELATIONSHIP AMONG SLAVS OF THE EARLY MEDIEVAL POLAND READ FROM ZOOARCHAEOLOGY

Author(s): Makowiecki, Daniel (Laboratory for Natural Environment Reconstruction, Inst of Archaeology) - Chudziak, Wojciech (Institute of Archaeology, Nicolaus Copernicus University, Torun) - Krajcarz, Maciej (Institute of Geological Sciences, Polish Academy of Sciences, Warsaw) - Krajcarz, Magdalena (Institute of Archaeology, Nicolaus Copernicus University, Torun; Institute of Geological Sciences, Polish Academy of Sciences, Warsaw) - Wiejacka, Martyna - Wiejacki, Jan (Institute of Archaeology, Nicolaus Copernicus University, Torun) - Janeczka, Maciej (Department of Animal Physiology and Biostructure, Wrocław University of Environmental and Life Sciences) - Skrzatek, Mateusz (Institute of Archaeology, Nicolaus Copernicus University, Torun)

Presentation Format: Oral

The horse's activity, like of other domestic mammals under human control, can be assessed by a set of biological features readable on sub-fossil bone deposits and skeletons. So far, the value of the horse for the Slavs living in the basin of the Vistula and the Oder was assessed through the commonly known natural predispositions of the species for mobility in space. This was considered a decisive factor of its usefulness to social elites in their military events and creation of social rituals and religion ceremonies. However, this was mainly interpreted on the basis of limited historical information. Bones of horses collected systematically over decades in settlements, castles, cemeteries and ceremonial places, which were used by Slavs, seem to be a good basis for undertaking studies on the relationship between these animals and their users. This time it will be a study based on biological features (sex ratio, age distribution, pathological alternations, size of bone and tooth) found in horse collections retrieved from about 130 sites. Osteological, osteometric, pathological, isotopic and genetic analysis will be used for this purpose. They will be carried out under the project titled Horse in Poland in the Early Piasts and Internal Fragmentation. The paper will present methodology and empirical data testing the basic thesis of the project. In it, the horse's functional traits, including the capacity for mobility, are treated as the basis for assessing the mammal's functional traits by Slavs in various cultural events, including trade, wars, transport, sacred ceremonies and hunting of wild or feral horses.

The project (2017/25/B/HS3/01248) is financed by the National Science Centre, Poland.

12 ANIMAL TRADE IN LITHUANIA: SPREAD OF FOREIGN ANIMALS DURING THE 17TH- 18TH C.

Author(s): Piliciauskiene, Giedre (Vilnius University, Bioarchaeology Research Centre) - Paškonytė, Jūratė (Šiauliai Aušra Museum)

Presentation Format: Oral

Analyses of numerous Late Medieval – Early Modern Period zooarchaeological material allow us to reconstruct animal morphology and husbandry in Lithuania during 13th-18th c. Osteometrical data of cattle, sheep and goat bones demonstrate no changes in animal size during the 13th-16th c.. No signs of foreign animals could be observed during this time as well. Foreign animals are not mentioned in any historical sources up to 17th c.. Entirely different situation is seen among the horses - individuals of various size and constitution appear in Lithuanian zooarchaeological material since Migration Period, horses from East and West are mentioned as gifts and trade objects in historical data since the 13th-14th c. Concerning the cattle and other domestic animals – changes appear only in 17th c., when bones of significant larger individuals originate in zooarchaeological material. These individuals could be remains of the first foreign cattle and sheep that, according to the historical sources, have been introduced to Lithuania manors in the 17th c. from Western Europe. Moreover, remains of extra-large, heavy type horses appears in the zooarchaeological material of the 17th – 18th c. The aim of our presentation is to demonstrate and discuss the general results of these analyses that concern animal trade during the Late Middle Ages and the Early Modern Period. Synthesis of archaeological and historical data together with zooarchaeological evidences allows us to determine the origin of the foreign cattle and horses in Lithuania, reconstruct ways of spread and the further success of these animals.

13 WOOLLY MAMMOTH AND MAN AT KRASNOYARSKAYA KURYA SITE (WEST SIBERIAN PLAIN, RUSSIA), THROUGH PALAEOBIOLOGICAL AND TAPHONOMIC ANALYSES

Author(s): Seuru, Samuel (Département d'Anthropologie, Université de Montréal) - Leshchinskiy, Sergey (Laboratory of Mesozoic and Cenozoic Continental Ecosystems, Tomsk State University; Institute of Archaeology and Ethnography, Siberian Branch of Russian Acad-

emy of Sciences) - Auguste, Patrick (Université de Lille –Sciences et Technologies, CNRS, UMR 8198 Evo-Eco-Paleo) - Fedyaev, Nikita (Laboratory of Mesozoic and Cenozoic Continental Ecosystems, Tomsk State University)

Presentation Format: Oral

The recovery of mammoth remains from deposits containing human tools has frequently been used as evidence of human megafaunal hunting. However, before drawing conclusions about causality, more robust evidence is required and human behavioural signatures should be positioned in a wider context at the level of the site and the landscape.

Detailed paleobiological and taphonomic analyses were carried out on bone accumulations discovered during the 2014 excavations at the Krasnoyarskaya Kurya site, (western Siberia). The number of remains (NISP) discovered in 2014 in the excavated area is 174. All identifiable bones (~ 75% from total quantity) were attributed to *Mammuthus primigenius* BLUM. The taphonomic analysis consisted in the observation of macroscopic modifications on remains and the general state of conservation, coupled with the use of quantitative units of analysis and observation. The palaeobiological analysis considered the dentition and limb bones for the age distribution. Sex ratio, body size and body weight of the fossils were determined using postcranial material as a basis. Isotopic analyses of the collagen from remains argue that the animal was living in a steppe landscape, which was dominated by grass-like vegetation.

None of the bones could be regarded as direct evidence of human hunting activity. However, the evidence suggests that this was a catastrophic death assemblage exploited by prehistoric humans pursuing a strategy of “optimal scavenging” during the early phase of the Last Glacial Maximum, about 14C -24 000 years cal BP. It is likely that a small herd of woolly mammoth, composed of at least four individuals, was trapped in the oxbow lake in springtime. The access time to bodies was fast, at most two days after the death of animals. This implies that humans had been monitoring herd movements and were able to quickly scavenge any nutritive and useful remains from the carcasses.

14 OPPORTUNISTIC COMMENSALISM OR À LA CARTE? STABLE ISOTOPES OF DOGS, CHICKENS AND HAWKS IN DEPOSITS FROM ANCIENT TO MEDIEVAL UKRAINE

Author(s): Grandal-d’Anglade, Aurora - García-Vázquez, Ana (Instituto Universitario de Xeoloxía, Universidade da Coruña) - Gorobets, Leonid - Ivanoff, Dmitry V. (Department of Palaeontology, National Museum of Natural History, National Academy of Sciences of Ukraine)

Presentation Format: Oral

When studying animal husbandry in ancient societies, the focus is usually placed on the most common domestic ungulates like cattle, sheep and goats, are referred to as food or as producers of food resources for humans. However, there are also domestic animals that provide other types of resources not necessarily related to feeding. They all weave, together with humans, a complex web of relationships. One of the ways to unravel these relationships is through isotopic study, which not only informs about the diet of individuals but also about the environment in which they lived and their interaction with the community.

In this study, we apply bone collagen stable isotope analysis (SIA) to domestic dogs, chickens and allegedly human-associated hawks from several sites in Ukraine, chronologically ranging from the Hellenistic period to the Middle Ages. It attempts to infer the potential trophic relationships between these and several other species, domestic and wild. The results show a variety of diets in chicken and dogs. The presence of C4 plants or fish in the dog diet is detected in some cases, but usually hens and dogs share similar isotope signatures indicative of their feeding on human food waste. Hawks, on the contrary, show isotope signatures of different food sources. In this way we glimpse an animal world that focuses on humans, even if not directly, as opposed to the wild world that follows a different dynamic.

15 NEW TRICKS FOR OLD DOGS: INVESTIGATING DIET, IDENTITY, AND HUMAN-DOG RELATIONSHIPS OF THE COAST SALISH

Author(s): Sparrow, Anna (Memorial University of Newfoundland)

Presentation Format: Oral

The Coast Salish of southern Vancouver Island, Canada, maintained distinct breeds of domestic working and companion dogs for over 4000 years. Using carbon and nitrogen isotope analyses from over 100 museum-collected dog remains from six archaeological sites, the agency of Coast Salish dogs, their entanglement with people, and the management of distinct breeds will be explored. Previous palaeodietary research in coastal British Columbia indicate patterns of high-trophic marine diets for both humans and dogs, however this does not align with the archaeological or ethnohistoric record of the Coast Salish. A re-examination of dog diets through multiple lines of evidence, including stable isotope analysis, ethnohistoric records, and Indigenous narratives, can identify variation in feeding management practices between breeds and, in turn, provide insights into individual identities of dogs. Although dog isotope values have primarily been used as proxies for human diet, in the context of relational ontology, both dogs and humans are permeable beings that are mutually constitutive with one another. This allows each being to grow, move, work, and evolve through constant social, emotional, and spiritual exchange. Investigating the foodways of dogs will provide greater insight into this relationship between species, breeds, and subsistence patterns over time and space.

AN ISOTOPIC INVESTIGATION INTO THE MOBILITY OF MIDDLE PLEISTOCENE HUNTERS AND THEIR PREY

Author(s): Bailey, Marian (Flinders University) - Kolska Horwitz, Liora (National Natural History Collections, the Hebrew University of Jerusalem) - Moffat, Ian (Flinders University) - Dosseto, Anthony (University of Wollongong) - Moncel, Marie-Hélène (Muséum National d'Histoire Naturelle, Paris)

Presentation Format: Oral

The hunting mobility of Middle Pleistocene hominins has been examined in the archaeological record through examination of parameters such as patterning of sites in the landscape and faunal remains. Stable isotopes provide an additional lens through which to view prey and hunter mobility in the past.

Using LA-MC-ICPMS, we analysed strontium isotope composition of fauna from two sites in MIS 7 (ca. 180-260 Ka); Holon on the coastal plain of central Israel and Payre in south-east France.

Results from 14 aurochs (*Bos primigenius*) teeth from Payre shows an overall $87\text{Sr}/86\text{Sr}$ range of 0.706246 to 0.715921 analysed from a total of 1,160 spots. Most of these individuals appear to be non-local to the immediate environs of the site. They show high degrees of mobility between different and distant geological units during amelogenesis. The extent of mobility increases at the transition from layer F to G in the site, which corresponds with a change from a more open to a semi-forested environment.

For the site of Holon, strontium analysis was undertaken on a total of 15 teeth of fallow deer (*Dama cf. mesopotamica*), aurochs (*Bos primigenius*) and straight-tusked elephant (*Palaeoloxodon* sp.). All samples show a limited range of $87\text{Sr}/86\text{Sr}$ values (0.707794 to 0.709378 analysed from a total of 821 spots) indicative of lower mobility than observed at Payre during amelogenesis. The signal derives from either carbonates approximately 13 km from the site or a kurkar (clay/silt) unit, at a distance of 2 km.

The observed differences may be attributed to singular or multiple factors including different hominin hunting strategies and mobility, differences in chronology within MIS 7 between sites, a more pronounced amelioration of climate in south-east France, or reflect the greater discrimination in strontium values for the diverse geology of geographic regions of south-east France as opposed to central Israel.

ANIMALS, HOUSEHOLDS, AND COMMUNITIES IN BRONZE AND IRON AGE CENTRAL EURASIA

Author(s): Schmaus, Tekla (Indiana University)

Presentation Format: Oral

Until recently, researchers in the mountainous zones of Central Eurasia argued that people who lived there in the Bronze Age were fully mobile pastoralists. Environmental conditions seemed to suggest that people and their herds would have used places only as seasonal encampments, never staying long in one place. However, skeletal markers from caprine (sheep and goat) remains demonstrate that in some "seasonal" places, animals were in fact present throughout the year. The presence of herds and humans in unexpected seasons demands that we reexamine the underlying social and political dynamics of these groups. There must have been social and political heterogeneity, which means that decisions about who would move and when they moved were more complex than previously imagined. Furthermore, negotiations over resource intensification and management would have taken place in the context of diverse needs and motivations, including those of the animals and those of different segments of human society. I argue that the best way to investigate these negotiations and to understand the needs and motivations of all parts of a pastoralist society is to approach excavations at the level of the household. What were the different roles played by human members of the household? Were all animal members of the household treated equally? In what ways did the animals' needs influence decisions about when and where to move? In this paper, I tack between extant archaeological data, ethnographic analogy, and the preliminary results of a new research project in Kyrgyzstan in an attempt to begin to answer these questions.

LANDCRAFT. HOW PEOPLE AND ANIMALS CO-CREATED IRON AGE AND ROMAN-PERIOD LANDSCAPES IN BRITAIN

Author(s): Chadwick, Adrian (University of Bristol)

Presentation Format: Oral

Later Iron Age and Roman-period rural landscapes in Britain were often divided up into extensive field systems and trackways, with areas of open, unenclosed land on slopes and higher ground, but also open areas on lowland river floodplains; areas which may have seen seasonal movements of people and livestock. In recent years, commercial developer-funded excavations in Britain have investigated extensive areas of field systems, and features on floodplains. Field systems and trackways are all too often relegated to the dull agrarian 'bits in-between' settlements, however, and are rarely considered as inhabited places in and of themselves. Yet these places were key arenas for human and animal sociality.

Theories of relational agency, meshworks and assemblages have emphasised the significance of non-human actants in the lived-in world, whilst some recent archaeological studies have stressed how the movements and practices of people and animals in the past were intimately interlinked. People and animals were co-creators of these agricultural landscapes, and the meshworks of materials and agencies that affected them (Chadwick 2016). They shared embodied experiences of movement and memories. This paper explores aspects of these embodied, agential archaeologies of animality.

References

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DISENTANGLING HUMAN FROM NATURAL FACTORS: TAPHONOMICAL VALUE OF MICROANATOMICAL FEATURES ON ARCHAEOLOGICAL WOOD AND CHARCOAL ASSEMBLAGES

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Vidal-Matutano, Paloma (Université Côte-d'Azur, CEPAM, CNRS; Universitat de València) - Henry, Auréade (Université Côte-d'Azur, CEPAM, CNRS) - Carrión, Yolanda (Universitat de València) - Allué, Ethel (IPHES)

Format: Regular session

Archaeobotanical charcoal and wood analyses rely on the observation of different microanatomical features impacting the ligneous cellular structure to variable extents. These features may result from a wide range of intrinsic and extrinsic factors alluding to different stages of the wood's taphonomical history: initial growth conditions, human selection, transformation/use and discard, post-depositional processes and archaeological sampling strategies.

This session welcomes papers from any geographical and chronological context in archaeobotany, ethnoarchaeology and/or experimentation dealing with microanatomical features visible on charcoal or wood and their archaeological relevance. Possible approaches include: anthracological signature studies (vitrification, fungal degradation patterns, radial cracks), characterisation of mineral inclusions or deposits hindering identification, dendrology, morphometry or wood traceology.

This session will also provide the opportunity for researchers to put their charcoal fragments under a microscope connected to a camera in order to share experiences of microanatomical signatures. Through a global reflexion on terminology/typology issues, potential origins of the processes involved and the confrontation of different case studies, we aim at providing a privileged space of discussion to improve our knowledge of past human practices.

ABSTRACTS

01 INTRODUCTION TO SESSION NB. 110

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Presentation Format: Oral

Archaeobotanical charcoal and wood analyses rely on the observation of different microanatomical features impacting the ligneous cellular structure to variable extents. These features may result from a wide range of intrinsic and extrinsic factors alluding to different stages of the wood's taphonomical history: initial growth conditions, human selection, transformation/use and discard, post-depositional processes and archaeological sampling strategies.

In this Introduction, we will inaugurate the session with a state of the art of the advances in Anthracology based on several approaches: ethnoarchaeological and / or experimentation studies, anthracological signature analysis (e.g. vitrification, fungal degradation features, radial cracks), characterisation of mineral inclusions, dendrology, morphometry or wood traceology. We will introduce the importance of these kind of approaches to contribute to our better understanding of anthracological assemblages not only from the more traditional palaeoecological point of view, but also from the palaeoeconomical perspective. Those published works that have developed new methodologies will be highlighted. Finally, we will present the general schedule of the session with the order of the speakers, the time for discussion and some organisational instructions. We will also invite the researchers to put their charcoal fragments under a microscope connected to a camera to share experiences of microanatomical signatures and to enrich the space of discussion.

02 HOW THE RECOVERY METHODS AFFECT THE REPRESENTATION OF WOOD CHARCOAL ASSEMBLAGES: A TAPHONOMIC APPROACH

Author(s): Arranz Otaegui, Amaia (University of Copenhagen)

Presentation Format: Oral

The flotation system is often regarded as one of the most efficient methods of recovery for plant macroremains. Over the last decades, however, several researchers have highlighted that the use of water can sometimes lead to the hyper fragmentation or destruction of plant remains such as wood charcoal and parenchymatic tissue. The aim of this paper is to discuss the available evidence on this topic and provide new data from Shubayqa 1, a hunter-gatherer site located in northeastern Jordan dated to 14.6-11.6 ka cal. BP. For this purpose I analyse wood charcoal remains recovered by machine-assisted flotation and dry sieving, and carry out taxonom-

ic and taphonomic analyses including the identification of vitrification, fungal degradation patterns, radial cracks and boreholes. I evaluate the results of the analyses using statistical methods and answer three main questions: 1) are there significant differences in taxa representation between flotation and dry-sieving wood charcoal assemblages? 2) Are there significant patterns on the distribution of taphonomic features by taxa?; 3) Does the presence taphonomic features alter taxa representation in wood charcoal assemblages, or are there other factors that could explain the differences observed?. Taken together, the results of this and other research works will help understand the nature of archaeological wood charcoal assemblages and provide a critical assessment to interpret wood charcoal frequencies in terms of past vegetation and wood gathering strategies.

03 THE MEANING OF CHARCOAL TAPHONOMICAL MARKERS VALUES IN PALAEOLITHIC PINUS SYLVESTRIS TYPE ASSEMBLAGES FROM THE NE OF IBERIA

Author(s): Allué, Ethel (Institut de Paleoeecologia Humana i Evolució Social; Universitat Rovira i Virgili)

Presentation Format: Oral

The aim of this work is to present the results of the classification of wood anatomy modifications on *Pinus sylvestris* type charcoal remains from Palaeolithic sites at the NE of Iberia. The high values of *Pinus sylvestris* type in these anthracological records has allowed a systematic observation of the taphonomic markers producing anatomy modifications. The analyses is based on a large *Pinus sylvestris* type charcoal collection from 7 sites representing values above 70% in each studied layer. The observed alterations, using an optical reflected light microscope, have been regrouped into 3 different types: 1) biological alterations related to the natural processes; 2) combustion alterations and 3) Postdepositional alterations. Within this regrouping we have been able to identify specific alterations such as vitrification, tension wood and cracks. Other alterations such postdepositional alterations or decay sings are not always related to an specific origin and sometimes classification might be unclear. The results show different values for each of the categories that allow to point out the presence of those alterations, however there is still a lack of understanding of the meaning of this value in an assemblage. Up to now I have no real answer to the meaning of the relative values within an assemblage, therefore the purpose in the presentation will be firstly, to present the results in the different sites and secondly to provide materials for an in situ classification and rethinking on the observed alterations by the session attending audience.

04 EXPERIMENTAL CHARRING OF DEGRADED AND HEALTHY WOOD FOR UNDERSTANDING FIREWOOD ACQUISITION IN PREHISTORIC SOCIETIES.

Author(s): Piqué, Raquel (Universitat Autònoma de Barcelona, Departament de Prehistòria) - Ciampagna, Maria Laura (CONICET-División Arqueología, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, Argentina) - Ortiz Moratles, Omar (Universitat Autònoma de Barcelona, Departament de Prehistòria)

Presentation Format: Oral

The goal of this work is to explore the preservation after charring of traits produced by environmental and biological agents on living and dead wood. An experimental approach is developed in order to obtain a reference collection of alterations in Mediterranean wood.

The experimental sample comprises seven taxa: *Pinus halepensis*, *Acer campestre*, *Populus* sp, *Ulmus* sp, *Genista* sp, *Quercus ilex* and *Corylus avellana*. Living and dead wood in different state of preservation were collected from three different places located in the Vallès Occidental region (North-east of Iberia). Four wood pieces of 1.5 cm length and 3 cm maximum diameter were obtained from each taxon, which were measured and weighed before carbonization. Thin slices of the three diagnostic histological sections (TS, LRS, LTS) were taken from one of the wood pieces and anatomical alterations due to environmental factors, xylophages and fungi, as opposed to healthy logs, was recorded before combustion. The remaining three different piece of wood of the same taxon were then charred at temperatures of 400, 500 and 600 °C respectively. Dimensions and weight were taken after charring to calculate shrinkage and traits produced during the carbonization at different temperatures (i.e. contraction cracks, vitrification) were recorded with the stereoscopic and optical microscope. Results show that xylophages galleries and tissue degradation by fungi and calluses observed in fresh material can be recognized after charring. These features differ from those morphological alterations produced by the charring process itself (vitrification, cracks or eyes).

Finally, these criteria have been applied for studying the charcoal remains of the site of Les Maletes (Montcada i Reixac, Vallès Occidental, Spain), dated second half first millennium BC, in order to identify and quantify the presence of this alterations and obtain a better understanding of firewood acquisition.

05 FORMING MECHANISMS, ENVIRONMENTAL RELEVANCE AND CULTURAL IMPLICATIONS OF VITRIFIED CHARCOAL

Author(s): COURTY, Marie-Agnes (CNRS) - ALLUE, Ethel (IPHES Institut Català de Paleoeecologia Humana i Evolució Social; URiV Universitat Rovira i Virgili)

Presentation Format: Oral

Experimental archaeology has not yet elucidated how combustion would produce wood vitrification thus leaving unsolved its relevance. We have emphasized the critical role of refractory nano-inclusions issued from atmospheric electrification that accumulated in the plant tissues during growth on vitrification. We present a refined knowledge on the linkage between air/aerosol quality during

growth conditions and two modes of vitrification processes for debating their respective archaeological implications.

Using present-day charcoal, we show how nanoparticle emission by fossil resource exploitation is recorded by mineral inclusions trapped within the ligneous cellular structure. Analyses with scanning and transmission electron microscopes equipped with EDS-microprobe reveal that the microinclusions consist of composite nanocrystallites. Their distinctive nanostructure reflects the low bioavailability of adsorbed impurities during growth which therefore accumulated within the ligneous cellular structure. Experiments show how the released impurities from fresh wood or charcoal by high energy process contribute to the ultra-fast formation of vitreous char and nanostructured polymer filaments. Present-day firing contexts illustrate two contrasting situations: (1) direct effect of lightning at the ground with production of partly vitrified charcoal together with polymer-based nanocomposites and patchy firing traces; (2) long-maintained, high temperature firing with production of vitreous charcoal, glassy mineral residues and only the rare, most refractory types of polymer-based nanocomposites.

Using well documented archaeological hearths, these diagnostic attributes help to further interpret the relevance of vitrification in charcoal assemblage and related firing features. Charcoal assemblage showing vitreous char with polymer nanocomposites, weathered ash and weak to absent firing imprints document the use of firewood grown during periods of repeated electrification events in response to aerosol increase in the atmosphere issued from wildfires, volcanisms or hypervelocity reentry. The ones with marked firing imprints, charcoal with various stages of vitrification and glassy ash document well mastered pyrotechnic activities for the intentional production of firing by-products.

06 WHEN EXPERIMENTATION RAISES MORE QUESTIONS THAN IT PROVIDES ANSWERS: LABORATORY REPLICATION OF VITRIFIED WOOD CHARCOAL AND ITS RELEVANCE FOR ARCHAEOLOGY

Author(s): Henry, Auréade (CNRS UMR 7264 CEPAM) - Orange, François (CCMA, Université Côte d'Azur) - Théry-Parisot, Isabelle (CNRS UMR 7264 CEPAM)

Presentation Format: Oral

Vitrification is a microanatomical feature well-known by charcoal analysts characterized by a localized to generalised homogenisation of the cellular wood structure which can hamper taxonomic identification. Even though it is agreed upon that vitrification is induced by the combustion process, the conditions of appearance of this phenomenon remain unclear: while charring temperature, degree of oxygen input and initial state of the wood are the causal variables recurrently cited in the literature, attempts of experimental replication of vitrified wood charcoal in laboratory conditions were mostly unfruitful. This highly contrasts with charcoal recovered from archaeological and (pedo)sedimentary sequences, where vitrification, even though affecting the assemblages to very variable extents, has been if not systematically, then at least commonly observed. However, the term "vitrification" encompasses a variety of heat-induced cellular degradations for which finer descriptive levels are crucially needed. After presenting a brief review of previous research around vitrification, the aim of this paper is to share the results of a first laboratory experiment which successfully allowed producing vitrified *Quercus*, *Populus*, *Fraxinus* and *Pinus* sp. charcoal (but not reaching unequivocal conclusions regarding the causal factors involved), to discuss possible archaeological implications of the presence of vitrified charcoal remains and to start a reflexion on proposing an ad hoc nomenclature for describing vitrification types and degrees.

07 SPATIAL ANALYSIS OF VITRIFIED CHARCOAL FRAGMENTS FROM CHASOGO-2 (TENERIFE, CANARY ISLANDS): A METHODOLOGICAL APPROACH

Author(s): Vidal-Matutano, Paloma (CEPAM, CNRS, Université Côte-d'Azur, PREMEDOC Research Group, Universitat de València) - Marrero Salas, Efraim - García Ávila, Juan Carlos - Pou Hernández, Sergio - Arnay de la Rosa, Matilde (U.D.I. de Prehistoria, Arqueología e Historia Antigua, Facultad de Geografía e Historia, Universidad de La Laguna)

Presentation Format: Oral

Anthracology traditionally focuses on the botanical identification of charcoal fragments in order to obtain paleoenvironmental data. It is also acknowledged that the anthropic origin of charcoal from archaeological sites makes it a potential marker of socio-economic behaviours related to fuel management. From this point of view, the development of socioeconomic approaches based on the recognition of anatomical signatures in wood charcoal has allowed us to focus on topics related to firewood use and anthracological formation processes. The causes of some of these microanatomical features, such as vitrification of charcoal, remain unknown contributing to the perpetuation of traditional interpretations (i.e. combustion at high temperatures, re-firing, oxidizing environment). The aim of this paper is to discuss the high percentage of vitrified fragments from Stratigraphic Units I – IX of Chasogo-2, a pre-Hispanic archaeological context at the highlands of Tenerife. For this purpose, wood charcoal remains from combustion structures and from the scattered context have been analysed. On the one hand, vitrification on *Pinus canariensis* charcoal fragments has been studied based on a microscopic observation protocol according to the location of the refractive appearance of the wood tracheids. On the other hand, the vitrified charcoal fragments have been spatially processed using GIS. This research, combining the observation of vitrification on charcoal with spatial analyses, constitutes an undeveloped methodological approach as spatial distribution analyses of firewood remains are still scarce. Thus, our data will provide further insight into this phenomenon by examining the spatial location of vitrified fragments from an integrated archaeological perspective.

08 PINEWOODS AND VITRIFICATION HIGH-LEVELS IN MESOLITHIC CHARCOAL ASSEMBLAGES IN THE EBRO VALLEY (IBERIAN PENINSULA). A SPECIFIC USE OR LIMITED AVAILABILITY?

Author(s): Alcolea Gracia, Marta - Mazo Pérez, Carlos (University of Zaragoza) - Piqué Huerta, Raquel (Autonomous University of Barcelona)

Presentation Format: Oral

The wood of Scots pine type (*Pinus tp. sylvestris*) dominates without exception the anthracological records in the mountainous edges of the middle Ebro valley during Mesolithic times. This ubiquity of the pine as firewood appears clearly associated with two alterations of the anatomy of wood: reaction wood and vitrification.

The presence of reaction wood, that appears associated to branches and leaning trunks, reaches values of up to 80 per cent in our charcoal assemblages. The presence of vitrification features reaches in some cases values until the 40 per cent regardless of the different stages or degrees of alteration in charcoal fragments. In this case, the causes of this anatomical alteration, that implies a variable fusion of anatomical constituents within the wood, are not well-known in the current state of the anthracological research. It has been proposed that it may be related to burning of particular pieces of wood such as twigs or bark, or it may also depend on the state of the wood before combustion or be associated to determinate conditions of combustion.

In this work we are wondering if this homogeneity of charcoal assemblages could be related to an intensive exploitation of this taxon during the Mesolithic and its specific use could be reflected in these alterations of wood anatomy or however it could be a consequence of a limited availability of forest resources in the environment. Our main aim is to provide new insights about human practices in fuel management in the past through wood charcoal analysis in archaeological contexts.

09 INFLUENCE OF OCCUPATION AND SEDIMENTATION PATTERNS ON CHARCOAL BIOALTERATION AT ABRIGO DE LA QUEBRADA (VALENCIA, SPAIN)

Author(s): Carrión Marco, Yolanda - Badal, Ernestina - Martínez, Carmen M. - Eixea, Aleix (Universitat de València) - Zilhão, João (Institució Catalana de Recerca i Estudis Avançats - ICREA) - Villaverde, Valentín (Universitat de València)

Presentation Format: Oral

The Abrigo de la Quebrada (Chelva, Valencia) is one of the widest Neanderthal sequences available in the Iberian Mediterranean basin. It has contributed a sequence with eight archaeological levels. The upper levels (I to V) range from MIS 3 to MIS 4 (40,500 ± 530 BP, 43,930 ± 750 BP, > 50.8 ky BP). Level VI is sterile, dated between 79 ± 5 ky and 82 ± 5 ky (MIS5). All the lower levels (VII, VIII and IX) are also dated in MIS 5.

Charcoal analysis has revealed a large amount of material with microbial alterations that may affect, among others, the differential conservation of plant taxa or the process of plant matter decay. We discuss the relationship of the fungal activity with the rate of sedimentation and human occupation patterns.

At the top of the sequence (levels III, IV and V), sedimentation is slow, resulting in palimpsests, while the lower part (levels VII to IX) evidences several short-term occupations, with a faster sedimentation. Microbial and fungal activity produces humus particles which have been identified along the whole sequence and reach high percentages in the upper levels, probably due to the slow sedimentation rate that favoured the open-air exposition of the organic remains.

In levels VII to IX the amount of preserved charcoal is high. In addition, the presence of carbonized and non-carbonized seeds stands out. Conservation of macroremains may be favoured by the rapid rate of sedimentation that preserved them from microbial activity.

10 ANALYSIS OF ACCIDENTLY COLLECTED CHARCOALS FROM CREMATED GRAVES. CASE STUDY OF IRON AGE MARVELÉ CEMETERY AND DUBINGIAI BURIAL MOUNDS

Author(s): Peseckas, Kestutis (The Nature Research Center)

Presentation Format: Oral

Until recently wood charcoals from cremated burials in Lithuania were considered of almost no importance and used only as samples for radiocarbon dating. Most of charcoal remains were not collected during excavations and species of wood used as a fuel in cremation rituals were never analyzed. It seems that information on fuelwood collection strategies in pre-Christian cemeteries excavated during the last century should be completely lost however there might be a possibility to revive at least some part of that information.

During field excavations when archaeologists were picking finds from burial pits occasionally some wood charcoals were accidentally put into the same bag with cremated bones and ended up in storage. The consistent search for wood charcoals amongst some Lithuanian Iron Age cremated bones nowadays stocked in storage rooms of Department of Anatomy, Histology and Anthropology of Vilnius University and analysis of their wood species yielded what would seem promising results however also presented with the dilemma of how these results should be interpreted. Their representational value is particularly questionable since charcoals that are collected for analysis in such way go through a hardly predictable taphonomic filter – a person that was picking cremated bones during archaeological excavations.

In this presentation the species analysis of wood charcoals from Iron Age Marvelé cemetery and Dubingiai burial mounds is discussed. The results are interpreted with consideration of natural environment surrounding the discussed cemeteries and mentions

of particular wood species being used in pre-Christian burial rituals depicted in historical sources and Lithuanian folklore.

11 GROWTH RING CURVATURES, A TOOL TO UNDERSTAND DEPOSITIONAL PROCESSES?

Author(s): Santeramo, Riccardo (University of Basque Country/Euskal Herriko Unibertsitatea; Geography, Prehistory and Archaeology Department; Heritage and Cultural Landscape Research Group - GIPYPAC)

Presentation Format: Oral

The spatial analysis of wood charcoal remains together with the study of their minimum diameter represent an important tool to understand depositional processes. This paper presents the study of the tree ring curvature of 2935 wood charcoal remains from the medieval deserted villages of Arganzón, Zaballa, Zornoztegi and Aistra and from the Treviño Castle (North-West Spain). The materials were mostly retrieved from fills (e.g. storage pits fills, post hole fills, etc.), as it is common in other archaeological sites in the region. The aim of this study is to understand the formation processes of these deposits and to try to link wood charcoal assemblages with specific activities. In the studied area, wastes, generated by the medieval settlements, were used to fill negative features (storage pits, post holes and in so doing), with the intent to level surfaces, to prepare new constructive phases or to place new agrarian deposits. However, some differences were recorded among the sites. In Zornoztegi, the results from refuse deposits show the predominance of large calibre wood, which may be indicative of construction materials. In the other sites, deposits related to the waste management show the presence of wood with a variety of calibres, which might be generated from domestic activities or from a mixture of different activities. The comparison between these sites highlights the existence of different waste management strategies even in relatively close villages and the existence of different behaviour of rural communities at the very local scale. Furthermore, this study shows opportunities and limits in the use of the growth ring curvature measurement as a tool to understand depositional processes.

12 ESTIMATING PLANT HEIGHT FROM ANATOMICAL TRAITS OF ARCHEOLOGICAL WOOD AND CHARCOAL REMAINS

Author(s): Paradis-Grenouillet, Sandrine (Department of Cultural Heritage, Padua University; Geolab UMR 6042 CNRS - Limoges Université; Eveha) - Bassetto, Davide - Anfodillo, Tommaso - Crivellaro, Alan (Dipartimento Territorio e Sistemi Agro Forestali, TESAF, Padua University)

Presentation Format: Oral

Over the last decades archeologists and archeobotanists focused their efforts on studying past human use of natural resources. To further understand human practices the structure of the forest (e.g plant height) needs to be considered. Continuous knowledge advance in plant structure and function and new analytical techniques can lead to further developments in interpreting stem anatomical data from wood remains to estimate plant height.

Height is linked to plant ecological strategy because height is a major determinant of a plant's ability to compete for light. In addition, plant height depends on some important ecosystem variables such as soil fertility, and the occurrence of natural or anthropogenic disturbances.

The structure of plant vascular system is designed to conduct water from roots to the leaves. Along a plant stem conduits diameter widen with increased distance from the tree top according to a power-law relationship. To compare different species, which evidently have different conduit dimensions, the Interspecific Widening Ratio (IWR) is calculated dividing the size of the conduits at the base by the size of the conduits at the top of each plant. The IWR appeared to be highly correlated to plant height independently of species, age, site and stand structure.

We used available data to estimate plant height from selected data sets of vessels size. In this way we simulated the situation in which plant stem remains are found in the field and their vessels measured. We also collected anatomical data to test the same procedure on vessels size from fresh wood samples that were subsequently carbonized and their vessels quantified.

Our results show that maximum plant height can be estimated with different degree of accuracy in relation to plant size classes. This methodology represents a step towards a deeper understanding of the impact of human activities on the past environment.

13 DIAGNOSTIC FEATURES OF THE CHARCOAL ASSEMBLAGES ASSOCIATED WITH THE SWIDDEN CULTIVATION

Author(s): Ponomarenko, Elena (Kazan Federal University; University of Ottawa) - Ershova, Ekaterina (Moscow State Lomonossov University; Kazan Federal University) - Bakumenko, Varvara (Moscow State Lomonossov University) - Tomson, Pille (Estonian University of Life Sciences)

Presentation Format: Oral

The slash-and-burn (or swidden) agriculture is the farming technique in which fields are burned and cropped for shorter periods than the follow-up fallow. Presumably, this system was ubiquitous since the Bronze Age, affecting mainly forests on sandy soils. The analysis of sandy forest soils used in the cycle of the slash-and-burn cultivation in 19-th century (Karula National Park, Estonia) allowed us to formulate the diagnostic features of charcoal assemblages associated with the slash-and-burn cultivation (SABC) and morphological features of soils affected by SABC. The swidden layers (Apyr) in sandy soils appeared as 5 to 10cm -thick, dark-colored humus layers with a characteristic scalloped lower boundary, formed by numerous round chambers and tunnels of digging bees,

from 1 to 1.7cm in diameter. The Apyr contained up to 30 charcoal fragments per gram in the >1mm fraction of soil, with the median length of 4 to 5mm. The charcoal fragments in swidden layers had a pebbly shape with the average width to length ratio ranging from 0.6 to 0.7; the surface of charcoal fragments in swidden layers was silt-coated. The low proportion of bark (<10% of fragments) and presence of charred buds and foliage clearly differentiate charcoal assemblages of the swidden layers from those originated by the forest fires. Swidden layers contained a remarkably high percentage of phytoliths, ranging from 200 to 50 thousands per gram of soil, with 20 to 50% of them being charred. All swidden layers contained dendritic and/or panicoid phytoliths and cereal glumes and paleas indicative of in situ cultivation of crops. A palinological signature of swiddens was a pollen spectrum consistent with the forest ecosystem (AP up to 100%) with a proportion of fire-dependant taxa, such as Onagraceae pollen and Marshantia spores; and a proportion of crop and weed taxa, such as Cerealia, Fagopyrum, and Centaurea cyanum.

a. WOOD AND CHARCOAL DECAY IN MAGDALENIAN LEVELS OF COVA DE LES CENDRES (ALICANTE, SPAIN)

Author(s): Badal, Ernestina - Martínez, Carmen M. - Real, Cristina (Universitat de València. Departament de Prehistòria, Arqueologia i Història Antiga. PREMEDOC) - Roman, Didac (SERP. Departament de Prehistòria, Història Antiga i Arqueologia. Universitat de Barcelona) - Villaverde, Valentín (Universitat de València. Departament de Prehistòria, Arqueologia i Història Antiga. PREMEDOC)

Presentation Format: Poster

Cova de les Cendres is located on the cliffs of Moraira headland (Alicante, Spain) at about 50 m.a.s.l. The Upper Palaeolithic sequence documented there is one of the most complete in the Spanish Mediterranean region (Villaverde et al., 2012). In this work we will focus on the conservation of pine and juniper remains in Magdalenian levels.

The Magdalenian hunter-gatherers collected all the morphological parts of pine and juniper and stored them in the cave for a later use as firewood (Badal, Martínez, 2018; Martínez, Badal 2017). In fact, uncharred wood, needles, leaves and cone fragments have been preserved, which shows a stock for short or medium term. The number of uncarbonized remains is very small in relation to the carbonized ones and they show natural degradation.

Anatomical alterations of the uncarbonized remains (wood, leaves, cones) are presented here and they are compared to the charred ones in order to analyze the differences between them. The wood is most vulnerable to decomposition. Both charred and uncharred material are degraded by microorganisms: fungi, bacteria and insects. However, wood fragments are smaller than most of the charred ones, they never exceed an average of 2 mm, and the anatomical structures are best preserved in carbonized materials. Therefore, carbonization enhances the conservation of plant remains in Cova de les Cendres.

Badal, E; Martínez, C.M. 2018. Different parts of the same plants. Charcoals and seeds from Cova de les Cendres (Alicante). Quaternary International 463: 391-400

Martínez Varea, C.M., BadaL E. 2017. Plant use at the end of the Upper Palaeolithic: archaeobotanical remains from Cova de les Cendres (Teulada-Moraira, Alicante, Spain). Veget Hist Archaeobot. DOI 10.1007/s00334-017-0616-0

Villaverde V., Roman D., Ripoll M.P., Bergadà M.M., Real C. 2012. The end of the Upper Palaeolithic in the Mediterranean Basin of the Iberian Peninsula. Quaternary International. N°272-273: 17-32.

121 CHILDREN AT WORK

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Le Roy, Melie (Archaeology & Palaeoecology School of Natural and Built Environment Queen's University Belfast) - Polet, Caroline (Royal Belgian Institute of Natural Sciences Department of Palaeontology; Faculté de Philosophie et Sciences sociales, Département d'Histoire, Arts et Archéologie, Université libre de Bruxelles)

Format: Regular session

A large part of the production activities of past populations have been documented, such as farming, hunting, fishing and mining. The participation of children in these activities is sometimes visible through traces left on associated objects by the young ones when they were learning such crafts, presumably under the guidance of adults (flint knapping or pottery modelling). It will be then interesting to reconsider the "division of labor" evoked by Leroi-Gourhan and Brézillon for the Magdalenian site of Pincevent (France) or by Binford for the Nunamiut people, by integrating the notion of age in addition to the gender aspect.

Furthermore, it is possible to observe physical evidence, such as markers on the bones. Such analysis is known and widespread in the anthropological study of adult individuals. However, this topic has never been envisaged for the immature cohort, but recent work proves it worthy. Indeed, it seems that children were also taking part in basketery among late Neolithic populations in Southern France, forming peculiar abrasion on their deciduous teeth. Also, the reconstitution of life conditions from the remains of young individuals discovered at the site of Caillons (France) attests to the exploitation of a servile young workforce. Studies in ethnography allow some pertinent comparisons concerning child labour, for example, the work of children in the mines of Congo.

Thus on the basis of archaeological and anthropological (social or biological) evidence, this session will aim to investigate the working contribution of immature individuals in past societies, from prehistoric to modern times.

01 EVIDENCE OF CHILDREN PARTICIPATING IN CRAFT ARTS AT THE END OF NEOLITHIC IN THE SOUTH OF FRANCE

Author(s): Le Roy, Melie (School of Natural and Built Environment, Queen's University Belfast)

Presentation Format: Oral

Dental wear can tell us a lot of things about human behaviour: alimentation, genetic condition, illness but also craft activities. In order to interpret it, it is necessary to differentiate the attrition process from the abrasion one. A mechanical action is generally admitted to explain the formation of abrasion marks on the teeth. A wide range of shapes is observed and seem to reflect different kind of activities.

It is well known through ethnographic and archaeological literatures that teeth can be used as a "third hand" in order to realise basketry or leathery. Some examples even allow to document a gender division of this kind of work, as in the Eskimoo tribes or in Native American populations.

At the end of the Neolithic in the South of France several case studies are observed in the skeletal collections uncovered in megalithic tombs. Only some individuals among the population seem to have undertaken such craft activities, using their teeth. Unfortunately, those human remains are mostly disarticulated assemblages because they come from collective burials. It is then difficult to discuss gendered activities. Nevertheless, recent studies identified for the first time deciduous teeth bearing such marks of abrasion. Therefore, despite of discussing gendered works we are able to discuss aged related involvement.

02 CHILDREN AND BABYS IN THE MINE - AGE AND SEX RELATED LABOUR DIVISION IN THE SALT MINES OF HALLSTATT

Author(s): Reschreiter, Hans - Kowarik, Kerstin (Natural History Museum Vienna) - Pany-Kucera, Doris (Austrian Academy of Sciences)

Presentation Format: Oral

The ancient salt production site of Hallstatt, situated in the Eastern Alps, shows evidence for salt production from the early Neolithic onwards, but offers special insights into the social structure of production communities in the Iron Age. The grave goods from the extensive cemetery demonstrate the Hallstatt salt miners to be one of the richest communities in Iron Age Europe. Anthropological analysis on the preserved skeletons as well as finds from the underground mines evidence the integration of the entire community into the mining process as well as labour division into age and gender groups.

Recent anthropological analysis of the subadult skeletons demonstrated for 100% of the investigated individuals traces of heavy work load on the upper spine. These traces show that children started to carry heavy loads regularly at least at the age of four or five. In addition findings of small-sized leather shoes and, recently a baby cap within in the underground salt mines evidences the regular presence of young and very young children in the mining galleries.

The combined archaeological and anthropological data gives us important insights into role and status of subadult individuals in this Iron Age community, where the same children took part in the mining process and were buried with rich grave goods. On a more general level we gain insight into a social group with strictly fixed roles and identities along age and gender lines and at the same time a remarkable capacity for innovation and adaptation.

03 SKILLED CHILDREN IN CERAMIC CRAFT- ARTISANAL INTERPRETATION OF A BRONZE AGE POT FROM PRYSSGÅRDEN SITE, SOUTH-EAST OF SWEDEN

Author(s): Botwid, Katarina (Department of Archaeology and Ancient History Lund University)

Presentation Format: Oral

The artisanal perspective affords us with the possibility of detecting the artisan. I have conducted artisanal interpretations of more than seven thousand ceramic finds in the extensive Pryssgård material. One vessel had fingerprints of a child.

I not only suggest that a child manufactured this medium-sized storage pot but that it was made with a level of skill that required at least three years of training. This suggests that the child was taking a serious part in the craft. The case study is made even more intriguing as the size of the fingerprints point to a craft person of about nine years of age giving that the child beginning to learn ceramics around the age of six.

One can discuss if a single case, like this example of participation in a working community, can bear the evidence of crafting children in general. So far it is an anomaly and anomalies tends to be over looked in the archaeological record. But by focusing on this unexpected find the possibility to detect more objects manufactured by children opens up, making a broader understanding of ancient crafting possible.

The method applied to the Pryssgård material, makes it clear that there are aspects of ceramic artefacts that can only be assessed by a trained professional ceramist. Children and their level of skill would not evade detection as easily. Evidence of children in crafts-production would contribute to existing theories and social ideas about division of labour and craftsmanship. In this paper the child at work will be in focus especially in the context of situated learning when it comes to craft manufacturing.

Finally, the paper discusses how an artisanal perspective can contribute to the cooperation between professional artisans and ar-

chaeologists. That, if extended further, could lead to more detailed and complex views of the past.

04 CHILD LABOUR ACCORDING TO PALEODERMATOGLYPHIC ANALYSIS

Author(s): Blaževicius, Povilas (National Museum – Palace of the Grand Dukes of Lithuania)

Presentation Format: Oral

As the method to investigate finger and palm prints, dactyloscopy is still rarely used for archaeological material, though the fingerprints from manufacturers are kept safe on the clay artefacts from hundreds or even thousands years ago. The data in such impressions could be examined to investigate individual features, the frequency or diffusion of specific fingerprint types etc. In this case the aim of the research is concentrated on the width of the epidermal ridges and their shift during the person's growth.

The data sources for this research are the clay finds from 14th – 18th cent., found during the excavations of the Vilnius (Lithuania) Lower castle. Analysis of more than 23 000 artefacts showed that only 1.5 percent bears fingerprints. By measuring the width of the epidermal ridges, age of individuals was determined and the children prints picked out. Investigation of children fingerprints was carried out searching for diversity of age, fingerprint localisation on the objects and the quantitative distribution between the different find groups (stove tiles, roof tiles, bricks, pottery, etc.).

The results showed that during the 14th – 18th cent. in the clay industry of Lithuania, with the final product formation worked 12 percent of children, aged from 8 to 13 years. Most often they produced bricks, floor tiles and roof tiles, seldom – pottery and vessel shaped stove tiles, rarely – stove tiles.

05 THROWING ACTIVITIES AMONG NEOLITHIC POPULATIONS FROM THE MEUSE RIVER BASIN (BELGIUM, 4500 – 2500 BC): FOCUS ON THE ADOLESCENT INDIVIDUALS

Author(s): Polet, Caroline (Royal Belgian Institute of Natural Sciences) - Leunda Martiarena, Merlin (Université Libre de Bruxelles) - Villotte, Sébastien (Université de Bordeaux) - Vercauteren, Martine (Université Libre de Bruxelles)

Presentation Format: Oral

The anterior band of the medial collateral ligament (MCL) is an important stabilizer for valgus stress at the elbow. Activities implying the throwing motion, when practised intensively and repetitively, can injure this ligament and its insertion (enthesis). If these activities occurred near the end of maturation, when the epiphyses are not yet fully fused, traction apophysitis can occur. This results in bony detachments in the area of the MCL insertion which can be partial (avulsion of one or several bony fragments) or complete (epiphyseal detachment). Today, these pathological conditions are well known and described in young baseball pitchers.

On archaeological dry bones, such lesions can only be observed in adults as scars. The lesions take the form of bony outgrowth or lacunae depending on whether the avulsed fragment re-united with the condyle or not.

The studied individuals derive from 16 cave burials from the Meuse River Basin, radiocarbon dated to the Middle and Late Neolithic.

We recorded the presence or absence of MCL lesions on 202 right and left humeri and studied the relation between MCL lesions, siding and robusticity. Sex could unfortunately not be established as pelvic bones could not be associated with the humeri in these Neolithic commingled graves.

A total of 6.5% of the humeri displayed MCL lesions, which affected only the right robust ones.

Four main types of activities can be proposed to explain the presence of this enthesopathy related to throwing activities: hunting, fishing, games and wood-cutting.

Our results put forward the hypothesis of a form of social division in throwing activity in the Meuse River Basin during the Neolithic. They also suggest that the throwing practice started from the young age, which invites us to think about the role of the teenagers in these prehistoric societies.

06 PHYSICAL STRESS IN A SUB-GROUP OF YOUNG INDIVIDUALS FROM THE EXCAVATED POPULATION OF ST. ROMBOUT'S CEMETERY, MECHELEN, BELGIUM (10TH-18TH CENTURY)

Author(s): Van de Vijver, Katrien (Royal Belgian Institute of Natural Sciences)

Presentation Format: Oral

Excavations on St.Rombout's cemetery in Mechelen, Belgium (10th-18th century AD), revealed 4,158 burials, including single, collective and simultaneous depositions, coffin and plain earth burials. Detailed study was conducted on 351 individuals. Over half were under 25 years old, with adolescents (12-17y) comprising 23.9% and young adults (18-25y), mostly males, 24.2%. Although all periods showed a high component of young individuals, their presence increased over time. A large number of young individuals is not unusual in medieval and post-medieval urban cemeteries and is often attributed to economic immigration.

St.Rombout's adolescents showed more growth disturbances, physical stress and disease. They were more commonly buried in plain earth and collective burials and showed a strong presence in simultaneous burials. Individuals from plain earth burials showed higher prevalences of growth disturbances and infection, while adolescents also showed more fractures, enthesopathies and periosteal new bone formation compared to adolescents in coffin burials. Individuals in simultaneous burials showed higher prevalences of Schmorl's nodes, fractures and enthesopathies, which considering their overall younger age suggests more severe physical stress.

Young adults showed similar patterns and medieval studies suggest that social adolescence could last into the late twenties. The similarities between adolescents and young adults and the occurrence of changes in burial patterns and skeletal changes around 25 years suggest an 'extended adolescence' also existed in Mechelen. There was a sub-group of young individuals with higher mortality, physical stress, growth disturbances and disease, possibly due to malnutrition, hard work, and exposure to infection. The skeletal patterns reflected the less expensive burials of young individuals, suggesting a poorer, more dependent social position. This suggests servants, apprentices or immigrants, whose presence is mentioned in the archival records. While this group would have had varied occupations and backgrounds, their lifestyle, with higher levels of physical stress, may have been similar.

07 WORK AND PLAY: A NEW APPROACH TO RECONSTRUCTING CHILDHOOD DEVELOPMENT AND ACTIVITY

Author(s): Palmer, Jessica (Leiden University) - Lieveise, Angela (University of Saskatchewan) - Waters-Rist, Andrea (University of Western Ontario)

Presentation Format: Oral

Past research into morphological changes to muscle and ligament attachment sites (entheses) on bone has focused solely on adults, with the development of several scoring methods aimed at discerning muscle morphology as an indirect indicator of types and levels of past physical activity. However, while insight into the physical activity of children could have far-reaching implications for our understanding of past societies, the existing methods cannot be applied to subadult bone due to intrinsic differences in how soft tissue attaches to developing bone. Therefore, to start analyzing variations in enthesal morphology of subadults, we present a newly developed method to score enthesal changes in growing individuals. Eight enthesal characteristics that were found to be variable between subadult individuals are observed at sixteen entheses from the upper and lower limb. These muscle attachment sites were chosen based on their location (i.e., distance from sites of epiphyseal fusion, and visibility; distinguishable and delineated). For each entheses, the eight variables are scored between zero and two based on presence and extent. These scores can then be combined to create a composite score which encapsulates the level and amount of osseous change occurring at the entheses under study. The scoring system was developed on twenty-nine individuals aged between three and seventeen from the Dutch post-medieval site of Middenbeemster. It was then applied by two enthesal change experts and one non-expert to create a user-friendly, effective, and consistent scoring system. This method is a first step to better understanding the development and individual variation of entheses among subadults, with the goal of informing on muscle and ligament morphology and, ultimately, possible links with activity patterns. Thus, studying enthesal change in subadults can throw new light on the role of children in archaeological societies, and the meaning of childhood in the past.

08 A CITY OF MILLS AND CANALS: PRE-TEEN AND TEENAGE WORKERS IN MID-NINETEENTH-CENTURY LOWELL, MASSACHUSETTS

Author(s): Murphy, Eileen (Queen's University Belfast) - McKean, David (Independent researcher) - Donnelly, Colm (Queen's University Belfast)

Presentation Format: Oral

Lowell, Massachusetts, is the birthplace of the industrial revolution in the USA and was established in 1821 by a group of Bostonian entrepreneurs who wished to harness the waters of the Merrimack River to power the waterwheels in their new textile factories. The water was brought to the mills by canals, with the canals dug and maintained by labourers. While this work employed many local Yankees, it also attracted emigrant Irish workers based in Boston, led by Hugh Cumiskey, who arrived to commence work in what had been the farmlands of East Chelmsford on 5th April 1822. As more Irish workers arrived they based themselves in a camp on the edge of the new town with their families which by 1830 had developed into an urban settlement that became known as the Acre.

We are fortunate that two volumes known as The Hanavor Burial Records exist that provide a window into the lives and deaths of the early Irish settlers in Lowell. Of the 8,000 records, some 1,450 entries, dating to the period between 1849 and 1865, provide details of the occupation of the deceased as well as, in many instances, the cause of their death. Labour roles were clearly gendered and involved children as young as 11 years of age. In this study we will attempt to ascertain the role that boys and girls played in the industrial workings of Lowell. We will examine the effect that such labours may have had on the quality of their lives as well as the impact on their health status.

09 THE IMPACT OF DEVELOPMENT ON INTERPRETING ENTHESEAL CHANGES IN CHILDREN

Author(s): Henderson, Charlotte (CIAS - Research Centre for Anthropology and Health, University of Coimbra)

Presentation Format: Oral

The study of the attachments of tendons and other soft tissues to bones has typically focussed on adults. Changes to these entheses have been used to infer activity patterns based on the frequency or severity. The aetiology of these changes is, however, poorly understood. Many changes increase in frequency in older adults, suggesting that normal tissue degeneration is an important factor in their occurrence. Other changes seem to be more common in younger individuals, indicating that these may be retentions of normal developmental processes. Utilising over 100 skeletons from two identified skeletal collections (known age, sex, occupation and cause of death) from Portugal this paper will study the relationship between enthesal changes, sex, age and puberty in children (defined here as <21 years of age). The individuals all lived during the later 19th and early 20th centuries with occupations including

domestic worker, student, labourer seamstress and soldiers. Enteseal changes were recorded using the new Coimbra recording method in both the upper and lower limb. The method was also applied to entheses which were not fully developed to record normal developmental features. Macropores, erosions and fine porosity were the most commonly observed features in those entheses that were not fully developed. Fissures were also observed, particularly in the rotator cuff insertions. These are all part of the normal developmental process. Fine porosity and textural change were the most common changes in older individuals and may represent changes associated with skeletal development. When using enteseal changes to infer activity it is important to understand the development of the enthesis and the aetiology of enteseal changes. Enteseal changes can be recorded in children, but the results indicate that using them to infer activity-levels or working patterns must take into account normal development.

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ELITE SETTLEMENT IN THE COUNTRYSIDE OF EARLY MEDIEVAL EUROPE (5TH-10TH CENTURIES AD): CHALLENGING ASSUMPTIONS AND NEW DIRECTIONS

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Quirós Castillo, Juan Antonio (University of the Basque Country) - Reynolds, Andrew (University College London)

Format: Regular session

Early medieval elite settlements are found throughout the European area. In some regions, particularly in northern Europe, they are sited to take advantage of dramatic topography, both natural and prehistoric, while in southern Europe, Roman topography often provides a focus or an inspiration. This session hopes to move beyond such a basic dichotomy to bring nuanced perspectives to notions of elite settlement by addressing a series of themes that demand a reassessment of the character and understandings of such sites: 1) Defining high-status settlements: hierarchy, scale, networks and society (this theme will focus upon the archaeological definition of elite culture); 2) Monumentality and setting: cultural references in the creation of elite space (this theme considers the expression of identities and the performance of power including the paradoxical relationships between funerary, domestic and monumental behaviours); 3) Material culture and elite settlement: taphonomy, social life, craft activities and consumptions (this theme explores daily life at elite sites); 4) Provisioning and hinterlands: surplus economics and interdependence (this theme investigates the role of elite sites in the production, collection, storage and redistribution of commodities). The overall aim of the session is to provide a comparative perspective of the emergence and sustainability of elite groups across a period of fundamental social, political and territorial change and to explore elite settlements as components of a wider picture of social complexity rather than as an isolated phenomenon. Papers should emphasise diachronic and comparative approaches rather than individual case studies.

ABSTRACTS

01 CONSTRUCTING AUTHORITY IN EARLY MEDIEVAL ELITE SETTLEMENTS

Author(s): Sofield, Clifford (University of Oxford)

Presentation Format: Oral

Elite settlements in early medieval Europe typically exhibit formal layouts and impressive, even monumental, construction. Great halls and palaces; elaborate alignments of buildings; burial mounds, churches, and other ritual structures; and private yards and massive palisades undoubtedly made for great optics, but the layout and composition of elite settlements also have much to reveal about the construction of authority and the performance of power. In early Anglo-Saxon 'great hall complexes', linear and cruciform alignments of the buildings would have allowed for ceremonial processions through the complex (Reynolds 2003), perhaps an important activity in negotiating and consolidating relationships among emerging elites. In a forthcoming paper (in press), I have argued that the formalization and exclusivity embodied in great hall complexes shows that access to kings was controlled by erecting both physical barriers and layers of ceremony and ritual.

This paper aims to move beyond the mere recognition of formality and monumentality in early medieval elite settlements, by proposing that settlement layout and composition reflect how elite authority was constructed, not just physically, but socially and politically. Principal features of the layouts and composition of rural elite settlements (including ecclesiastical and cult sites) are identified for each of three regions (Britain, Scandinavia, and northern France) and interpreted as physical embodiments of socio-political mechanisms for building elite authority. By comparing and contrasting how space was constructed, used, and controlled in elite settlements of each region, the paper seeks to establish similarities and differences in the ways in which elites established and maintained power throughout early medieval northwest Europe.

References

A. Reynolds (2003), Boundaries and settlements in later sixth to eleventh-century England, *Anglo-Saxon Studies in Archaeology and History* 12, 98-136.

C. M. Sofield (in press), Shaping buildings and identities, in Bailey et al. *Architectural Representation in Early Medieval England*.

02 IMITATING MYTHS: STRÖJA AND ELITE SETTLEMENTS IN EASTERN MIDDLE SWEDEN

Author(s): Hjulström, Björn - Lindeberg, Marta (Arkeologikonsult)

Presentation Format: Oral

One or more elite settlements have been excavated in more or less every province of political importance in Sweden during the early medieval period (5th-10th century). The province of Östergötland was the sole exception up until our recent excavations in Ströja. Ströja immediately became a central place in the region. We suggest that the extravagant feasting (seen in a meat surplus and beer production) and ritual activities at the site were important tools to define the residence as a regional elite settlement. The swift establishment suggests that the founders wanted to make a statement (e.g. large hall-building, sacrificial area). This can be explained in various ways. We suggest that the founders used new ideas about how the elite should behave and look.

From comparisons with similar elite settlements, we argue that the architecture of the buildings and its symbolism was more important as a manifestation of social status than e.g. burial mounds. We have identified attributes, both in architecture and in dress accessories, which we believe were ways for the elite in Ströja to express their own unique identity. During the mid-7th century, the site transforms and several smaller farms are established. From this period we have not identified the large farm itself but the finds and the continued use of the sacrificial area up until c. 900 A.D. suggest that there was still an elite settlement at the site. We propose that the settlement transformation were a way for the elite to adapt to new situations and a mean to control the resources (goods, labour, land) and should not be seen as evidence of a more egalitarian settlement.

03 DAILY LIFE AND SOCIAL IDENTITY IN THE SHADOW OF RULERS IN EARLY MEDIEVAL GAMLA UPPSALA (C. 0400- 010 050)

Author(s): Lucas, Malin (Upplandsmuseet)

Presentation Format: Oral

Gamla Uppsala (*Old Uppsala) is an Early Medieval centre of influence in Central Sweden. It encompasses official functions of law-making, cult and trade, as well as specialized crafts and residences for privileged groups. Also, in literary sources it emerges as an extraordinary religious centre. Starting from the 6th century AD, the erection of 70 metre burial mounds, massive house foundations, and rows of tall posts resulted in a large scale monumentalisation; a physical as well as symbolic manifestation of the site and its inhabitants.

Recent excavations have shed light on the wider population of this site and through analysis of finds and features from both graves and adjacent settlements, we have been able to identify the social make-up of the inhabitants. Furthermore, we have been able to identify hierarchical differences between contemporary and adjacent settlement units, as well as to illustrate the development of these over the course of the studied period.

The paper aims to give insight into the methods used in identifying various social groups and to discuss the difficulties and the possibilities encountered during the study. It will furthermore discuss the various functions and identities highlighted by the analysis. It also touches on how these groups compare to those on other, contemporary sites.

04 NO MAN IS AN ISLAND – ELITE RESIDENCE AND LOCAL COMMUNITY IN DENMARK 0500- 01 0500 AD

Author(s): Borake, Trine (Museum of Western Zealand; Aarhus University)

Presentation Format: Oral

This paper offers a bottom-up perspective where interdependence and interaction with the local community play an essential part of the emergence, existence and functions of elite residences. I propose, that strategies of decentralization, communal networks and justified leaders are at work in the local community to reassure and renegotiate a balance of control and power.

For long, focus in Scandinavian studies of elite settlements has been on internal structures; their position in a social hierarchy and as an agent in over-regional communication systems. However, elite settlements are not a uniform and isolated phenomenon, but demonstrate great variation; they can be seasonal or annual and they can emerge and decrease testifying a dynamic social organization. Their layout and material culture likewise show great variations demonstrating different functions. Accordingly, a top-down approach, as offered by the Central Place Theory and widely applied, does not fully explain the complexity of the societal organization and social dynamics.

Instead, I will argue, that elite residences are maintained and legitimized only through a mutual relationship with the local community and different services such as juridical, social or cultic must be offered and accepted to meet and support a local demand. Accordingly, an alternative approach to elite settlements must focus on the local community.

By investigations of artefact composition, topographical strategies, place names and cartographical sources in the North-western region of Zealand, an interdisciplinary and diachronic analysis of social organization and dynamics is presented, and the theory of decentralization, communal networks and justified leaders discussed.

05 PEOPLE AND POTTERY IN EARLY MEDIEVAL ENGLAND: EXPLORING THE EMERGENCE OF ELITE SETTLEMENTS THROUGH EVERYDAY DOMESTIC MATERIAL CULTURE

Author(s): Backhouse, Lisa (University of Reading)

Presentation Format: Oral

Pottery is one of the most expressive markers of both trade and social complexity, particularly for the early medieval period, and hence illustrates distinctions between elite and ordinary consumers. Over the past decade, a number research projects have focused on ceramic data and successfully demonstrated its ability to support archaeological research of the emergence of elite settlements in England during the early medieval period. Furthermore, the increasingly theoretical approaches being applied to ceramic studies has highlighted the potential of this everyday material culture in understanding aspects of identity and social groups, in addition to more traditional analysis of pottery production and pottery circulation and accumulation used to explain the origins and character of settlements based on social and political complexity. However, the majority of these studies have been carried out through the analysis of luxury ceramics and of long-distance trade; hence research emphasis usually falls on decorated ceramics, feeding a view that other wares do not communicate information about those who made and used them, or the settlements they are recovered from. Data refined in this way does not lead to meaningful conclusions about elite sites because only a fraction of ceramic material evidence is considered as useful. Domestic pottery provides an everyday material perspective of the social and political complexity of elite groups and therefore yields a vast amount of information often overlooked. This paper explores how the study of local political entities and elite settlements must rely on commonplace, everyday domestic ceramics from local and regional trade, allowing the micro-economy to be examined alongside the macro-changes in elite settlement development and wider society.

06 MASTERING THE LANDSCAPE TRANSFORMATIONS: ARCHAEOLOGY OF THE EARLY MEDIEVAL ELITES IN THE NORTH ADRIATIC AREA

Author(s): CALAON, Diego (Ca' Foscari University, Venice)

Presentation Format: Oral

North Adriatic area could be taken as an extraordinary region to study the role of archaeology in defining elites and their function in reshaping new social and economic settings between Late Antiquity and Early Middle Ages. Archaeology has provided materials to understand the characters of elites' sites, proving the continuity or discontinuity elements that would have laid the foundations of new European communities. The area may be illustrated by recurring of a set of prepackaged dichotomies (Lombard-Frankish/ Byzantine; western/oriental; military role/economic role; religion/politics etc.) in which new elites would have found their spaces in constructing power and consolidating relationships. National and local historiographic agendas intensely biased these directions and their archaeological interpretations: dichotomies have been used differently in Italy (focusing on religious structures/elites and continuity) than in the eastern Adriatic (aiming to follow and discern the ethnic/identity issues).

A global post-Braudel approach it is advocated. The analysis of the interrelations between landscapes and societies may help to put aside - at least for a while - the conclusive result of the whole process: the rise and the affirmation of Venice as the elite site. The review of archaeological data helps us to reconsider the interplay between topographic locations (even the dramatic ones), demography and labor control in securing the sustainability of the rising elites.

Commodities consumption/distributions or the characters of the memory/monumental structures appear archaeological proxies that are not sufficient to describe the rise of the authority. From Ravenna to Istria, it is possible to follow a multifaceted countryside/coastal panorama: islands, river mouths, and swamps became the setting where technical knowledge in mastering the landscape transformations - coupled with lands "ownership" - have been the constituents of a new system of sustainable power.

07 PROJECT NEU-MED: PUBLIC POWERS AND ELITE SETTLEMENTS IN RURAL AREAS BETWEEN 9TH AND 10TH C (TUSCANY AND CENTRAL NORTHERN ITALY)

Author(s): Bianchi, Giovanna (University of Siena)

Presentation Format: Oral

The article presents the initial results of research carried out as part of the ERC Advanced Grant 2014 project on Origins of a new economic union (7th-12th centuries): resources, landscapes and political strategies in a Mediterranean region (<http://www.neu-med.unisi.it/it/>).

The issue of communications, which is presented in this session, is addressed in line with the project's macro-objective, which consists in investigating the preconditions for economic growth in the Mediterranean area which underlay the major development of the 12th C.

The initial results of the research carried out so far in southern Tuscany have revealed, in the rural context, a moment of sudden change between the second half of the 9th and the 10th century. A series of clues lead us to suggest an important role by public powers underlying these changes, both in the transformations in the topographical layout of rural sites, and in the ways in which resources were managed, in the context of a probable renewed relationship between the countryside and the city.

Within this context, it is important to understand the role of elite groups belonging to the main political groups, and lesser, rural elites, in creating the conditions for these changes, and also in taking an active part in them.

Did these processes have a possible repercussion in material culture, in the hierarchy of rural sites, in defining specific forms of organization or particular elite spaces, or in a different management of the economies?

This paper intends to present preliminary considerations regarding these questions, expanding our gaze from early medieval Tuscany to the other regions in central and northern parts of Italy, marked by the same political and institutional system, with the aim of providing data which can be compared to other contexts in the Mediterranean area, and also outside of it.

08 RURAL SETTLEMENTS, LANDSCAPE AND POTTERY STUDIES, THE EXAMPLE OF A MICRO-REGIONAL APPROACH: THE RIBEIRA DA LAGE VALLEY (ALENTEJO, PORTUGAL)

Author(s): Nunes da Ponte, Teresa (CEAACP-University of Coimbra/FCT)

Presentation Format: Oral

In this paper we will discuss and analyze some archaeological data obtained from the study of the pottery of archaeological sites, spatially and chronologically related to the occupations detected in the Roman / Late Antiquity and Islamic site of Torre Velha 1 (Serpa, Southern Portugal), along its diachrony, illustrating different types, internal dynamics and settlement models. The sites illustrate rural transformation along the periods and are of a significant reference for the identification of further contemporary settlements in the region, allowing us to create and develop new approaches, similar to what is known and has been done in the rest of the Iberian Peninsula.

09 AN ELITE SETTLEMENT AT LA MARAÑOSA (MADRID, 5TH-7TH AD): CERTAINTIES AND UNKNOWNNS REGARDING THE EARLY MEDIEVAL HILL-FORTS IN INNER IBERIA

Author(s): Vigil-Escalera Guirado, Alfonso (University of Salamanca) - Martínez González, Javier - Fuente Rodríguez, Luis - Gutiérrez de León Juberías, Pablo - Martínez Requejo, Alfonso - Torres Ortiz, Mariano - López Rosendo, Ester (Universidad Complutense de Madrid)

Presentation Format: Oral

The site of La Marañosa is located on the edge of a cliff above the floodplain in the western bank of the Jarama river, 20 km to the southeast of the city of Madrid, in the center of the Iberian Peninsula. Just below the hill is located a summer ford over the river. The defensive character of its location, surrounded by abrupt and deep ravines, is reinforced by a linear wall at its northern end. The enclosed area extends about 10 hectares.

Material evidence from this site provides enough elements to propose that it was a rural central place, in the sense expressed by Loveluck (2009: 145), that is, a focal point for consumption. Elites at this site are engaged in local and supralocal networks, as suggested by the variety and quality of imported goods: glass vessels, fine Mediterranean pottery, coins, lava quernstones from very distant quarries. Certain elements, such as large ashlar, seem to indicate the presence of prestige buildings.

The occupational sequence still denotes questions that topsoil fieldwork cannot solve in much detail. Material evidence from two different historical moments (5th to 7th and 10th to 12th AD) have been recognized in addition to scattered remains of a Late Iron Age phase. Nonetheless, the sequence does not seem continuous, but separated by hiatus of absence of activity.

The archaeological record from la Marañosa raises different questions on the historiographical debates with regards to this kind of sites. The most significant may be (1) the discontinuities in the occupational sequences, (2) the links with the previous (late Roman) rural settlement in the area and with the subsequent network of villages, (3) why did people change their place of residence, and (4) what did that displacements imply in the social, economic and ideological spheres.

10 CONTINUITIES AND TERRITORIAL CHANGE IN THE COUNTRYSIDE OF TOLETUM (SPAIN): THE EMERGENCE OF NEW ARISTOCRATIC AND CHRISTIAN BUILDINGS (5TH-8TH C.)

Author(s): Sánchez Ramos, Isabel (UCL Institute of Archaeology)

Presentation Format: Oral

With a strategic geographic location near to the major Roman routes in the middle of the Iberian Peninsula, Toledo was the Visigoth capital from Theudas in the year AD 546 until the collapse of the Kingdom in the early 8th century. Most of the present-day and well-known evidences of power architecture linked to the new local elites (residences, churches, monasteries and burial memorials) are placed in the countryside rather than the city of Toledo (Spain). Archaeology has attested the collapse of the Roman territorial model and its substitution by a genuine early medieval one. This model is characterized by the appearance of new monumental complexes after the large Roman villae were abandoned, in which monastic and sacred complexes (e.g. Los Hitos, Melque and Guarrazar) linked to the aristocracies of Toledo acquired a marked preference. Topography of the new settlements to be discussed was connected, but not necessarily, with previous Roman central-places. Local elites are the key for understanding the social, cultural and economic dynamics during the 5th and the 8th centuries, and this paper will start out with the need to offer new ways of looking at and thinking the countryside architecture and landscapes of early medieval societies by exploring monumentality, epigraphy and material culture. In addition, interrelations between buildings and their surrounding landscapes will be also explored whereas possible in terms of ideological, economical and political issues. The state-of-the-art archaeology of some of the most relevant sites in this geographical area will be presented to offer a diachronically overview of this phenomenon.

11 LATE ANTIQUITY IN THE INTERIOR OF CARTHAGENENSIS: LATEST DEVELOPMENTS IN THE RESEARCH OF SETTLEMENT STRUCTURE

Author(s): Valero Tévar, Miguel Ángel (Universidad de Castilla-La Mancha)

Presentation Format: Oral

The outdated conception that pictured Late Antiquity as a period associated with negative connotations, such as the existence of a deep crisis, decadence, and the degeneration of the ancient world, has been left behind. Current research has shown that the reality is otherwise, coming forward as a fundamental stage full of changes ranging from politics to religion, together with social aspects, not to mention economic ones.

In the inland territories of the Carthaginensis province, thanks to the latest archaeological projects focused on the period, some light has been shed on an era that had traditionally been associated with an eloquent lack of data.

Thus, it can be seen that rural settlements in the form of grand villae are linked to wide areas of cereal production together with major animal husbandry activities that would probably take place among the various praedia of the domini. Furthermore, other rural settlements have been documented, such as vici, pagi, hamlets, etc. the latter proving vital in order to understand the exploitation of the territory.

During the 4th century it becomes apparent that some of the towns in the area are still prosperous, such as Valeria, Ercavica y Segobriga, these being episcopal sees.

However, from the 5th century onwards a new and extensive agricultural model comes into play, while it is also observed that, at the time, the domini become the guarantors of economic and social stability for neighbouring communities, while willingly accepting the arrival of Christianity and making use of it to strengthen their social ascendancy over the rural population. It is at this point that ancient Roman sites such as the Mausoleum of Llanes get turned into sites for the Christian cult, architectural spaces are adapted to the new religious reality or new buildings are raised such as the Monastery of Servitanus.

12 ANÁLISIS DE LOS MAMÍFEROS DEL YACIMIENTO TARDOANTIGUO DE EL CASTILLÓN (SANTA EULALIA DE TÁBARA, ZAMORA): CONTRIBUCIÓN DE MANDÍBULAS Y FALANGES

Author(s): González Cabezas, Oscar - Portero Hernández, Rodrigo (Grupo de Investigación Reconocido PREHUSAL, Universidad de Salamanca - USAL) - Andrés Chaín, Miriam (Departamento de Prehistoria, Universidad Complutense de Madrid - UCM) - Sastre Blanco, José Carlos (Asociación Científico-Cultural Zamora Protohistórica) - Álvarez Fernández, Esteban (Grupo de Investigación Reconocido PREHUSAL, Universidad de Salamanca - USAL)

Presentation Format: Oral

Los estudios arqueozoológicos de épocas tardoantiguas están cobrando gran importancia en la actualidad, ya que, además de permitirnos conocer la forma de vida de las sociedades durante este período, nos ayudan a comprender mejor los cambios en los patrones alimenticios y las posibles transformaciones socioeconómicas. Comenzado a excavar en el año 2007, el poblado tardoantiguo de El Castellón ha sido un referente en el estudio de los diversos ámbitos de la época tardoantigua. Este yacimiento se encuentra situado sobre un cerro amesetado, a 5 km de la localidad zamorana de Santa Eulalia de Tábara, en la margen izquierda del río Esla. Cuenta con 12 sondeos asociados a diferentes áreas de producción, vivienda y actividad cotidiana, las cuales, corresponden a tres fases de ocupación datadas entre los siglos V y VI. Ha sido considerado como un centro de poder fronterizo entre suevos y visigodos, debido a que se asocian diversas formas de producción recogidas entre unas fuertes defensas.

En esta comunicación se presenta el estudio arqueozoológico de los restos de mamíferos de El Castellón. El conjunto que se ha tomado como referencia han sido las mandíbulas y las falanges de todo el yacimiento, sobre el que se han efectuado estudios taxonómicos, tafonómicos, de representación anatómica y de rangos de edad. El objetivo es determinar a qué especies pertenecen dichos elementos óseos, establecer cuáles son las causas de la aparición de los taxones e inferir diferentes actividades económicas llevadas a cabo en el poblado. Dichos análisis nos permitirán precisar si en él se establecieron individuos de cierta relevancia social.

136 THE INTERPRETATION AND PRESENTATION OF ARCHAEOLOGICAL AND CULTURAL HERITAGE SITES: NEW TRENDS AND TRANSNATIONAL PERSPECTIVES

Theme: Archaeology and the European Year of Cultural Heritage

Organisers: Jameson, John H (ICOMOS ICIP; 12,000 Year History Park) - Musteata, Sergiu (Institute of Archaeology, Romanian Academy)

Format: Regular session

As stated in the conference announcement, the 2018 European Year of Cultural Heritage is an occasion to celebrate European identity and diversity of cultures and historic dialogues between the two. Cultural Heritage, as an expression of European cultures, can be an important mediator between pasts and futures. New philosophical/methodological trends in public interpretation are reshaping the messages delivered at archaeological/cultural heritage sites throughout Europe and worldwide. The role of the experts, as well as the participatory engagement of

audiences and stakeholders, is being redefined and reassessed. For example, the communication technique of facilitated dialogue is used by professional interpreters to connect and interact with audiences. Facilitated dialogue engages and fosters an environment where the experiences of participants are shared and explored. It is designed to join the experiences and expertise of participants to contemplate conditions and opportunities for impacting the topic or issue being discussed. Dialogue facilitators need not be topical experts. This session examines new trends and transnational perspectives, as well as levels of communication - from local to regional, national and international - on public interpretation of archaeological and cultural heritage. Do these activities represent new emphases in interpretation, and can they contribute to, or help mediate, dialogues between European identity and diversity of cultures? Can they be shared experiences as examples of best practice at national and international levels? What are the interpretation and presentation challenges for the future?

ABSTRACTS

01 SESSION INTRODUCTION. FACILITATED DIALOGUE: A NEW EMPHASIS FOR THE INTERPRETATION OF CULTURAL HERITAGE SITES

Author(s): Jameson, John H (ICOMOS ICIP)

Presentation Format: Oral

This session is a follow-up to a similarly themed symposium at the January 2018 Society for Historical Archaeology (SHA) Annual Meetings in New Orleans. I will summarize the results of the SHA session as prologue to this session, including plans for a proposed publication on the topic. I will introduce and explain the interpretive communication technique of facilitated dialogue (FD) that is increasingly utilized by professional interpreters to connect and interact with audiences. FD is a conversation between individuals in which a facilitator helps to overcome communication barriers regarding an issue of mutual concern. It is designed to join the experiences and expertise of participants to think through the conditions and opportunities necessary to impact the topic or issue discussed. FD is designed to foster an environment where the experiences of participants are shared and explored. The goal is to create a safe and unbiased environment for participants to consider other perspectives. Dialogue facilitators do not need to be experts on the topic being discussed. Does FD represent a new emphasis, or more profound pedagogical shift in cultural heritage interpretation? Does FD result in more effective interpretation in creating connections and facilitating perceptions and meaning for audiences, which are the primary goals of interpretation?

02 ARCHAEOLOGY EDUCATION IN THE UNITED STATES: PAST, PRESENT, AND FUTURE

Author(s): Moe, Jeanne (none)

Presentation Format: Oral

Since the 1980s American archaeologists have developed and delivered education to the public both as long-term programs and short-term projects. Concomitantly, the Archaeological Resources Protection Act was amended in 1988 mandating federal land managing agencies to education the public about the significance of archaeological sites on public lands and the importance of preserving them for present and future generations to learn from and enjoy. Some of these education programs have endured while others have faded away. Hallmarks of successful programs include putting the needs of educators first, including descendant members in the development and distribution of educational materials, and employing archaeological stewardship to teach citizenship at a deep conceptual level. This paper will provide a brief history of archaeology education in the US, the successes of current programs, the realities of educating an enormous population about archaeological sites, and the challenges of remaining relevant to educators in the 21st century. Project Archaeology, a national program launched in 1990, provides a cogent example of the challenges of maintaining a program for almost 30 years and building long-term sustainability for the future. Relevant community-based projects demonstrate both the challenges and efficacy of developing educational projects with community members and maintaining programs over the long term.

03 THE ARCHEOLOGY AND PALEONTOLOGY CAMPUS OF THE AUTONOMOUS UNIVERSITY OF BARCELONA

Author(s): Piqué, Raquel - González Marcén, Paloma (Universitat Autònoma de Barcelona, Departament de Prehistòria) - Olesti, Oriol (Universitat Autònoma de Barcelona, Departament de Ciències de l'Antiguitat i Edat Mitjana) - Risch, Roberto (Universitat Autònoma de Barcelona, Departament de Prehistòria) - Vicente, Oriol (CORE Patrimoni Universitat Autònoma de Barcelona)

Presentation Format: Oral

The Archeology and Paleontology Campus of the UAB is a network of university departments, research groups and research centers, local and regional administration, museums and archaeological parks where the UAB develops its research and training. This smart structure consolidates the existing relationship between the UAB and the national research centers, national and local museums and different municipalities recognizing the sites and their associated infrastructures as a part of the UAB Campus thus a stable collaboration in the field of training, research, valorization and dissemination. This type of university campus expands and improves the collaboration of the University with the territory and becomes an element to promote local heritage, as well as a pole of innovation and transfer of knowledge generated from archaeological and paleontological research.

In the different campus locations, the actors of the quadruple helix are represented: local governments, research, the heritage and tourism industry (content, museology, didactics and heritage management companies) and end users and communities as well as

students that receive formal university training or visitors that receive non-formal education in the Museums and Archaeological Parks. The involvement of local associations of study and dissemination of heritage is present as well.

Currently there are 14 locations of the Archaeology and Paleontology Campus that covers a wide type and chronological range of sites, from Paleolithic to Medieval times. This presentation focus on the experience of the campus at different levels of education.

04 HERITAGE AND INTERSECTIONALITY—INDIGENOUS AND WESTERN VALUES WITH PRAGMATIC APPLICATIONS

Author(s): Schmidt, Peter (University of Florida)

Presentation Format: Oral

To meet heritage management goals in Africa requires long-terms engagement with communities. Such deep engagement between Western-trained archaeologists and heritage managers holds the possibility of intersectionality—the interwoven linkage among different yet similar concepts and practices. Intersectionality has the potential to lead to synthesis of local knowledge with knowledge held by professional archaeologists and heritage managers—a condition that arises when values from diverse partners are juxtaposed in daily practice. To arrive at a synthesis requires patient listening, a readiness to change and accommodate, and a will to arrive at the best pragmatic solutions. Africa provides an exciting frontier for experimentation with intersectionality in diverse settings. This paper presents several examples of intersectionality and synthesis of traditional heritage knowledge with the professional knowledge of heritage managers and archaeologist in Ethiopia, Zimbabwe, Kenya, and South Africa—all of which illustrate the value and pragmatism of intersectionality in heritage studies and management. In this discussion, I propose a number of conditions that foster a synthesis of knowledge, namely, using patient listening together with a readiness and will to change and accommodate in achieving pragmatic goals and effective outcomes. These cases are presented as a model of intersectionality that may be applicable to settings outside Africa.

05 THE INTERPRETATION IN ARCHEOLOGY: CHALLENGES AND PROBLEMS OF THE PRESENTATION OF A PREHISTORIC SITE

Author(s): Barbosa, Maria (FLUP - Oporto University; CITCEM - Transdisciplinary Research Centre «Culture, Space and Memory»; FCT - Portuguese Foundation for Science and Technology)

Presentation Format: Oral

The challenges of modernity place in Archeology the social responsibility to present interpretive, intelligible narratives about the Past. Analyzed in the light of the present, the Past reveals a subjective and plural dimension, whose interpretation (transversal to the totality of the archaeological practice) and its transformation in dialogue with the different publics, is an integral part of the heritage management.

Although post-processual archeology gives greater attention to the phenomenological experience and the micronarratives of the contexts, they continue to be ignored in the processes of conservation of archaeological sites. Traditionally, what is presented to the public is a very limited view of the site. On the one hand, by materializing a single interpretative discourse, ignoring the variability of possible hypotheses, it conveys a simplistic idea of archaeological practice itself, which is by nature made up of doubts and options. On the other hand, the conservation fixes a certain moment or phase of occupation/use of the site, ignoring the time density and complexity of the site. Multifunctional sites, which have played different roles simultaneously or have undergone mutations on their own meaning in time, become more difficult to convert into interpretative discourse. In addition, the conservation of sites is subordinated to concrete agendas and obey the norms and aesthetic values specific to their cultural framework, which leads to the creation of a homogenizing vision of the Past and ignore the plurality of meanings of the social practices.

Taking an approach to the morphological and conceptual peculiarities of a prehistoric monumental precinct, Crasto de Palheiros, in northern Portugal, the problems and challenges in the development of interpretative discourses of a site of this nature will be exposed. It is intended, therefore, to discuss the process and the aim of Interpretation in Archeology, particularly the challenges in the interpretation of prehistoric sites.

06 ADDING VALUE TO HERITAGE MANAGEMENT: PUBLIC INVOLVEMENT IN MONUMENT DESIGNATION

Author(s): Schreurs, Jose - Verschuur, Marjolein (Cultural Heritage Agency)

Presentation Format: Oral

Our contribution to the session consists of a reflection on the possibilities of public participation in the designation of archaeological monuments. In the Netherlands, we are currently revising our strategy on the protection by the state of archaeological sites with national relevance. We have approximately 1500 designated archaeological monuments, which have been listed based on professional criteria such as unicity, representivity, and physical quality. Following the FARO convention, we feel however that to make heritage management sustainable, it needs to be strongly rooted into society. The way to move forward with this is public involvement. To get a better grip on the possibilities of public participation in the process of designating monuments, we have conducted an international survey and stakeholder research. In our lecture we will present the outcomes of this research and dig deeper into the possible advantages and pitfalls of public involvement in this particular process. We will investigate the most suitable way and moment of involving the public. Do we involve the public in the selection of monuments or should they rather choose from sites that are already

proven to be scientifically significant? Do newly designated monuments need to have meet all the scientific criteria, or is the fact that they are valued by the public enough to grant national protection? And how about public outreach once they have been listed?

07 INTERPRETATION PANELS IN THE ARCHAEOLOGICAL SITES IN ALBANIA. IS THERE A DOUBLE STANDARD FOR UNESCO AND NON-UNESCO SITES?

Author(s): Kodheli, Elisabeta (University of Tirana)

Presentation Format: Oral

Focusing on the interpretation of cultural heritage, this article explores the current situation and problems of the interpretations panels in the archaeological parks and historical centers in Albania. The aim of this article is specially to give some suggestions on how these interpretation panels should be having in mind the interpretation principles given from Freeman Tilden. I focus primarily on giving a general view of how the interpretative panels have changed throughout the years in some archaeological parks and historical centers such as Bylis, Butrint, Shkodra, Apollonia, monumental graves of Selca e Poshtme, Korça, and Berat. The main issue of this research is how an interpretative panel should be organized, including how to write the text and in how many languages. Also, the research includes where and how the interpretative panels should be placed. According to John Veverka, two of the main principles of interpretation are to provoke attention and curiosity and to reveal messages in imaginative ways. Having in mind these two principles, I intend to give my suggestions on how an interpretative panel in the archaeological parks and historical centers should look like to attract visitors' attention. Another important issue where I focus is whether there is currently a double standard in sites which are included in UNESCO World Heritage List and sites that are not part of it. In my opinion, there should not be a double standard in the interpretative panels of the archaeological parks and historical centers in Albania. In my opinion, an appropriate decision would be to have consistently unique designs of the interpretative panels in all the sites in Albania, but with the condition that in the panels of UNESCO sites such as Butrint and Gjirokastra and Berat carry, in addition, the UNESCO logo.

08 HERITAGE OF COMMUNISM AND EUROPEAN IDENTITY: A CRITICAL HERITAGE PERSPECTIVE

Author(s): Demeter, Laura (Leibniz Institute for East- and Southeast European Studies) - Iacono, Francesco (McDonald Institute for Archaeological Research, University of Cambridge)

Presentation Format: Oral

Starting the 1970s, the European Union intensively engaged in heritage preservation and promotion as a means to shape 'European identity'. This project not only was aiming at strengthening Western Europe in face of increasing identity and economic struggles but also invested in shaping an ideal alternative to socialist internationalism. It is undoubted that the enlargement of the EU after 1989, swallowing what remained of the former Eastern Bloc, has de facto united under a unique institutional roof, countries which traditionally had very different political organizations, values, and lifestyles. The importance of these differences was endlessly analyzed in fields as different as history, anthropology, and cultural studies. Yet their consequences in processes of identity formation through heritage at European level have seldom been explored. To this extent, museums and heritage with their connection with individual and social identity represents the obvious arena where the clash between different ideas about the past and identity in their relationship with the super-national dimension of the European project can express itself, not least because of the continued need of the EU of historical roots to legitimize its activity. Communism was the concept central to the self-definition of the former eastern bloc, and its current heritage representation encapsulated very different world-views that can be fruitfully analyzed and compared. The most evident fault line relates undoubtedly to the 'internalist' view of formally Eastern bloc countries to be contrasted against the tourist gaze of the western visitors. In addition, the top-down approaches supported at the European Union level through the means of various policies to shape an 'European heritage' and 'European identity' in the former communist countries have also represented a powerful presence in the continent. In this paper we will discuss these broad discursive contradictions supporting our discussion with examples coming from a variety of European states.

09 GOLD RUSH VS. HERITAGE PRESERVATION. ROȘIA MONTANĂ CASE (ROMANIA)

Author(s): Musteata, Sergiu - Cozma, Elena (Institute of Archaeology, Romanian Academy, Iasi branch)

Presentation Format: Oral

Our presentation will be focused on three main issues. The first part will be about cultural heritage from Roșia Montana and its importance for World Heritage. The second part will be the analysis of the recent initiative to explore gold resources and community involvement. The third part will discuss the Roșia Montana case in the Romanian mass media. Roșia Montana has been the most active gold mining center of the Apuseni Mountains (the western side of Romania's Carpathians), from the earliest works in the Bronze Age to Antiquity, through the Middle Ages, all the way into modern times and up to the recent past. Traditional, family, or small group operated mining ended in 1948 with nationalization and the subsequent industrial state run mining ended in 2006. With that long history, in 2016, the National Institute of Heritage and Ministry of Culture from Romania placed the site on the UNESCO Tentative List and in 2017 presented a dossier for inscription in the World Heritage List. Their actions made many 'waves' in mass media, social media, and in the political world. Mass media was an important channel that propagated the information about protests of civil society, lawsuits with Gabriel Resources Gold Corporation, and political games between the former Minister of Culture and the new Government.

10 PRESENTING HALMYRIS – CHALLENGING PERSPECTIVES ON THE ROMANIAN LOWER DANUBE FRONTIER

Author(s): Hanscam, Emily (Durham University) - Karavas, John (College Year in Athens - DIKEMIS)

Presentation Format: Oral

The site of Halmyris, a Roman fort in the Danube Delta, Romania is uniquely relevant within ongoing dialogues on modern identities and European cultural heritage. Halmyris is the focus of an international field school which has brought over 150 volunteers to excavate in rural Romania, and an annual Orthodox pilgrimage attracting thousands of pilgrims to commemorate the martyrdom of Saints Astion and Epictet at Halmyris in 290 CE. The Roman past as cultural heritage in Romania has an additional layer of complexity, given the significance of the Romans within the Romanian national narratives and consciousness. While the regional authorities are responsible for site presentation and interpretation, we have found that the presence of international volunteers and the pilgrims have created a dialogue which the presentation of the site itself must mediate. Halmyris faces a number of presentation challenges, which have been recognised as such only because of the diversity of stakeholders at the site. This paper will address those challenges, one example being how the site reflects tensions between the Romanian Orthodox Church and the Romanian Ministry of Culture who see Halmyris as a means to further their agendas, and international volunteers/visitors who view it as a Roman frontier fort akin to those in Britain or Germany. We will also explore how cultural heritage sites like Halmyris have the potential to foster empathy and understanding between transnational perspectives and national identities.

11 ARCHAEOLOGICAL HERITAGE AND THEIR INTERPRETATION: THE KUANUM'S WAY

Author(s): Juana Maria, Huelamo (Kuanum) - Solias Aris, Josep Maria (Museu de l'Hospitalet)

Presentation Format: Oral

In today's postmodern society, the recovery of historical and archaeological heritage seeks to find the meaning of things through "authenticity" and many people try to find it in the cultural heritage as a sign of the immutability of "their" culture. This article will try to review the philosophical roots of this trend of thinking in the field of heritage. It is about archaeological reconstruction of the ancient gastronomy, food and historical reenactments, didactic workshops of the five senses. It will also try to study the actions that are taking place by different heritage reconstruction groups that try to introduce the viewer into the total experience of past life. In addition, it will explain how KuanUm was created with the aim of disseminating the historical and archaeological heritage to all types of public, regardless of their level of knowledge and skills. To achieve this goal, we try to combine the work procedures of experimental archaeology, ethnoarchaeology, recreation, living history, and tools for active pedagogy with the results of the available research on history and archaeology. The outcomes, in general, tell a story of daily life and, more specifically, ancient gastronomy or archeogastronomy. The desired result of these actions is that the user receives information through the five senses, so that heritage learning becomes a sensory experience.

12 COCEV KAMEN, THE EXCAVATION SITE WHICH JOINS THE GROUNDS FOR SACRIFICIAL RITUALS, TEMPLE, PAINTED ROCK ART AND MEGALITHIC PREHISTORIC OBSERVATORY

Author(s): Dusko, Aleksovski (World Academy of Rock Art)

Presentation Format: Oral

"Cocev kamen" is one of the most imposing and significant cultural monuments. As a matter of fact, "Tsotsev kamen" is a significant prehistoric temple and observatory. One of two paths leads towards a natural cave, which was rearranged for the needs of Paleolithic and Neolithic inhabitants. Gea Mater, a bone, has been discovered near the cave which tells us that one of the numerous caves was used by Paleolithic people.

The question about the usage of these caves has been answered: They did not have any practical usage, but one held ritual-ceremonial functions for the God of Wine and the God of Fertility. At the bottom of the cave there are rock engravings in the style typical of the valley, as well as the square type, associated with the God of the Fertility. The engravings (cup-mark associated with small channels) on the rock near the megaliths, suggested that the cave was used to worship the God of Fertility. The second space of the site is more impressive. In front of the throne there was a plateau of 51m² for official people who followed the ceremonies. The excavation site represented a prehistoric observatory. In fact, near the throne there were a few seats built in the rock, which were part of a sophisticated observatory. Megaliths were found more than four hundred meters to the east of these stone seats. There is painted rock art to the west of "Tsotsev Kamen", the production of a developed prehistoric culture. The presence of the world's largest sun symbol made in rock confirms that this site represents an extremely important cultural, historic, written, ethnological, as well as religious, heritage.

MODELING THE SPREAD OF AGRICULTURE: THE APPLICATION OF COMPUTATIONAL MODELING TECHNIQUES TO THE NEOLITHIC TRANSITION

Theme: Theories and methods in archaeological sciences

Organisers: Bergin, Sean (School of Human Evolution and Social Change, Arizona State University) - Pardo-Gordó, Salvador (Departament de Prehistòria, Arqueologia i Història Antiga, Universitat de València)

Format: Regular session

The transformative effect of the spread and adoption of agriculture cannot be overstated. For this reason, archaeologists have often focused their research upon this period hoping to understand both the ecological causes and impacts of this transition as well as the social motivations and constraints. Clearly an understanding of both the social and ecological factors at play during this period as well as the linkages between them will be crucial in order for research into the Neolithic Transition to progress. As we continue to aggregate more data, data that continues to increase in sophistication, about the Neolithic transition we are often left with few ways to relate these datasets to one another.

Recently in archaeology, the application of computational modeling tools has been increasing as an advantageous technique for understanding and analyzing archaeological datasets, especially those that pertain to complex prehistoric events. In this respect, computational modeling techniques such as network analysis, agent-based modeling, bayesian modeling, climate modeling and the simulation of summed probability distribution of radiocarbon dates have the potential to assist in our understanding of the Neolithic transition. This session showcases multiple applications of computational and statistical modeling to the spread and adoption of

agriculture and papers focusing on this topic are welcome in order to emphasize the benefits such techniques have for archaeological analysis.

ABSTRACTS

01 INTRODUCTION TO SESSION 148: MODELING THE SPREAD OF AGRICULTURE

Author(s): Bergin, Sean (Arizona State University, School of Human Evolution and Social Change) - Pardo-Gordó, Salvador (GRAMPO Research Group, Department of Prehistory Autonomous University of Barcelona)

Presentation Format: Oral

The spread and adoption of agricultural economies has long been recognized as a major turning point in human prehistory. The agricultural way of life has been tied to a wide range of social, economic and ecological consequences that continue to be felt to this day. Initial investigations of the Neolithic transition focused on explaining the ecological and social dimensions of why this subsistence shift occurred and today, archaeologists are also focusing on understanding the social and ecological impacts that occurred as a result of this transition. New excavations and new types of analyses have continued to increase the sophistication and the amount of data available. On the other hand, even though archaeologists have continued to accrue more information about Neolithic transitions, we are often confronted with how fragmentary the archaeological record can be. Thus, it seems that we have, or will have, a plethora of data while at the same time we rarely have datasets that represent the complete archaeological record.

Computational techniques such as modeling have emerged as a method for understanding both large and incomplete datasets. Moreover, computational techniques serve as a useful platform for integrating new techniques such as network analysis or climate modeling with archaeological data and with one another. This paper will introduce our session which hopes to showcase some of these approaches while focusing on the Neolithic transition around the world.

02 EUROPE'S LOST FRONTIERS: SIMULATING EUROPE'S WETTEST NEEDLE IN ITS MOST INACCESSIBLE HAYSTACK

Author(s): Murgatroyd, Philip (University of Bradford) - Ch'ng, Eugene (University of Nottingham, Ningbo) - Butler, Micheál (University of Bradford)

Presentation Format: Oral

Agent-based modelling forms a vital component within the Europe's Lost Frontiers project, a five year, ERC-funded project exploring the submerged landscape of Doggerland, under the North Sea. The simulations are intended to take data from a variety of different sources, including sedimentary DNA, seismic mapping and conventional environmental archaeology, and bring them together within a sandbox environment to test hypotheses regarding the natural and social processes operating within the landscape. This puts agent-based modelling centre stage in a multidisciplinary, cutting edge archaeological project that seeks to examine a previously largely unexplored landscape which is highly likely to contain evidence of the Mesolithic-Neolithic transition.

Previous work at Bouldnor Cliff has suggested that the introduction of domesticated varieties of wheat may be introduced to the UK before the inundation of Doggerland. Although Europe's Lost Frontiers contains a coring programme to recover sediment from the sea bed, it is unlikely to hit the remains of an occupied site in such a way as to provide direct evidence for the nature of the occupation. Under these circumstances, we would have to rely on indirect markers of human interactions with the environment in order to examine how mobile hunter-gatherers adopted new technologies and ways of life.

In this paper we will discuss how we use ABM to bridge the gap between the masses of data in our sediment cores and the vastness

of the landscape from which these cores were taken. We will specifically focus on how ABM is helping to identify markers of the Mesolithic-Neolithic transition in an environment in which these markers may look very different to those found on land.

03 THE SPREAD OF MAIZE CULTIVATION: QUANTITATIVE ANALYSES

Author(s): Fort, Joaquim (Universitat de Girona; ICREA) - Kohler, Tim A. (Washington State University; Santa Fe Institute) - Blake, Michael (University of British Columbia)

Presentation Format: Oral

We evaluate the models of mainly demic vs. mainly cultural spread of maize agriculture in the Americas using a database of archaeological maize from sites listed in the Ancient Maize Map database (<http://en.ancientmaize.com/>). We include only the oldest maize macro-remains directly dated using AMS or conventional ^{14}C methods and we omit all indirectly dated maize samples, including micro-remains, and samples with evidence of contamination, yielding a total of 116 archaeological sites. Given that the oldest maize sample comes from the Guilá Naquitz cave site (ca. 6229 cal yr BP) in Oaxaca, Mexico and that the wild ancestor of maize (*Zea mays* ssp. *parviglumis*) is also found there, we used a point in that state (98°W, 17°N) as the hypothetical locus of origin for the dispersal of cultivated maize. This yields the highest average correlation coefficient (0.7) between sample age and distance north and south of the origin. The intercept ranges of the linear regressions to the sites north and south of Oaxaca overlap with one another, suggesting a common origin for maize's spread throughout the Americas. To the north of 17°N there are 84 sites with a spread rate of 0.82-1.32 km/yr (95% confidence-level interval), suggesting (according to demic-cultural wave-of-advance models) that the spread to the north could have been mainly demic. To the south of 17°N there are only 32 sites, giving a spread rate of 1.35-2.75 km/yr—faster than to the north, though the two ranges almost overlap. Considering only the average rate to the south (2.05 km/yr), the demic-cultural wave-of-advance models suggest that the spread southwards could also have been mainly demic. However, this interpretation does not hold for the upper rate (2.75 km/yr), leaving open the theoretical possibilities for either a mainly demic or a mainly cultural diffusion for the southward spread of maize.

04 MODELLING THE BEGINNING OF AGRICULTURAL STRATEGIES: AN ANALYSIS OF RISK MANAGEMENT AND WORKFORCE INVESTMENT

Author(s): Alcaina-Mateos, Jonàs (CaSEs Research Group; Department of Humanities, Universitat Pompeu Fabra) - Zurro, Débora (CaSEs Research Group; Department of Humanities, Universitat Pompeu Fabra; Department of Archaeology and Anthropology, Institutació Milà i Fontanals, Spanish National Research Council - IMF-CSIC) - Caro Saiz, Jorge (CaSEs Research Group; Department of Humanities, Universitat Pompeu Fabra; GSADI, Department of Sociology, Universitat Autònoma de Barcelona) - García-Granero, Juan José (School of Archaeology, University of Oxford) - Madella, Marco (CaSEs Research Group; Department of Humanities, Universitat Pompeu Fabra; Department of Archaeology and Anthropology, Institutació Milà i Fontanals, Spanish National Research Council - IMF-CSIC; Catalan Institution for Research and Advanced Studies - ICREA)

Presentation Format: Oral

The transition from foraging to food production is one of the key events in human history. Archeology has paid special attention to the origin and spread of agriculture, often focusing on climatic, technological, and palaeodemographic aspects. New research has shown that the OA is not a rapid, linear and uniform transition but an heterogeneous, non-exclusive process that developed over several centuries or even thousands of years. More specifically, the importance of mixed economies is currently being explored together with the role of possible unsuccessful attempts or the boom-bust population pattern of agriculture spread at regional level, ultimately questioning the artificial dichotomous classification between foragers and farmers.

In this presentation we introduce CULM –Modelling Plant Cultivation in Prehistory– a model that aims to address the issue of the adoption of food production by means of community labour investment and risk estimation from a formal perspective. The main objective of the model is to explore the wide array of strategies adopted by past human communities under different environmental conditions, detecting the main factors involved in and the causality of economical changes and imbalances. For this purpose, we use a theory building framework to overcome the intrinsic shortcomings of the archaeological data, such as partial record and representativeness uncertainties, which allows testing our hypotheses and examine the emergent phenomena derived from specific theoretical scenarios.

05 MODEL-BASED RECONSTRUCTION UND UNDERSTANDING OF THE EUROPEAN AGRICULTURAL EXPANSION

Author(s): Wirtz, Kai - Lemmen, Carsten (HZG) - Gronenborn, Detlef (RGZM Mainz)

Presentation Format: Oral

The expansion of agriculture and pastoralism in Western Eurasia marks one of the quantum leaps in global prehistory. This expansion is believed to reflect both local and endogenous societal transformation processes, feedbacks with the environment, and the displacement of both people and ideas. The relative importance of endogenous versus exogenous processes, however, is largely unknown, and empirical evidence that quantifies the expansion process is laden with uncertainties. Here we propose to use a quantitative and comparative virtual experiment that resolves socio-technological dynamics and regional-scale exchange through an adaptive trait-based model. This model is based on the definition of a few societal key traits such as technological diversity, and simulates their regional trajectories using evolutionary principles. Simulated regional trajectories of the transition to agriculture ad-

equately represent the empirical radiocarbon record on this transition in Europe and disclose possible diffusion mechanisms underlying that transition. Our simulations also provide consistent and realistic estimates of population density and its fluctuations in the period 9,000-4,000 yr cal BP. Climatic shifts were found to play a minor role for socio-technological development, but to moderately affect population densities and even critically trigger large-range migrations. Our model study finally points to a decisive role of social and technological decline in shaping regional trajectories and in particular shows that regional exchange, local transformations, and the sensitivity to external forcing must not be regarded in isolation but strongly depend on each other.

06 EARLY WARNING SIGNALS REGARDING POPULATION TRENDS IN THE NEOLITHIC TRANSITION OF IBERIA

Author(s): García-Puchol, Oreto - Diez Castillo, Agustín - Bernabeu Aubán, Joan (Universitat de València) - Pardo Gordò, Salvador (Universitat de València; Universitat Autònoma de Barcelona)

Presentation Format: Oral

Several studies indicate that ecosystems resilience exhibit decrease signals before regime shifts. Considering human dynamics, the Neolithic constitutes a techno-economical revolution that implies a significant increase in population according with SPD from calibrated radiocarbon dates as a relative demographic proxy. The use of SPD methods in several European regions have revealed periods of boom followed by collapse in a non-linear model.

Following a previous work published by Downey, Randal Haas and Shennan (PNAS 2016), we have applied a generic test known as early warning signals (EWSs) to the reconstructions of population trends in the regions of the Iberian Peninsula in order to explore EWS statistic (autocorrelation, variance and skewness) before the Neolithic bust is detected.

In accordance with the dual model proposal we assume that an initial foreign expansion constituted the driving force of the subsequent spread in Iberia. In recent works we have used SPD methods as a relative demographic proxy to explore socio-ecological dynamics regarding the Neolithisation process in Iberia. The results obtained in some regions exhibit an initial boom regarding the introduction of agricultural way of life followed for a bust pattern at the end of the early Neolithic. The observed regional variability reinforces this conclusion, and highlights differences between the Mediterranean corridor (where a quick Neolithic expansion is well documented) and the Ebro valley, where acculturation processes could have a greater opportunity.

07 LOOKING FOR PREHISTORIC DEMOGRAPHY THROUGH THE LIVING AND THE DEAD: A CASE OF STUDY FROM THE IBERIAN LATE PREHISTORY

Author(s): Jimenez-Puerto, Joaquin R - Bernabeu Aubán, Joan - Escribá, M^a Pilar - García-Puchol, Oreto - Diez-Castillo, Agustín (Departamento de Prehistoria, Arqueología e Historia Antigua de la UVEG)

Presentation Format: Oral

The transition to agriculture is a key period of Humanity's History, providing unresolved puzzles with important implications for subsequent periods. Evolution of first agricultural societies, which presents phases of expansion and cultural homogeneity followed by periods of dispersion and diversity, is an issue of interest.

All this information suggests that there are hints of cycles of significant growth and dispersal. However, it is not clear yet whether such cycles are common, why that seems to affect some regions, but not others, and the actual mechanisms underlying them. This phenomenon is not exclusive of early stages of Neolithic. By the end of the period, the cultural landscape looks like fragmented and regionalized, all together with an economical and spatial re-organization, setting the basis for the Bronze Age. One of the possible methodologies to deal with these issues is through summed probability distributions of radiocarbon dates (SCDPD), which are applied to make inferences about prehistoric demography.

It is needed to study the long term dynamics in the area of Central Mediterranean region of the Spanish peninsula, in order to analyse the demographic evolution of the region. So, we propose to use the radiocarbon data together with archaeological information derived from the surveys carried out in the last decades in the East of Iberia. We will conduct a diachronic analysis from Neolithic to Bronze Age, in order to explore, a) the existence of cycles during the late prehistoric periods (7500-1500 cal BC) in Iberia; b) the reliability of the SCDPD curves as a proxy of demographic data (we will match the data with that of burials and total occupied area, and settlement number obtained by surveys performed on the well-known region of central Mediterranean Spain to verify their value); and c) their traits and the probable mechanism beneath them.

08 THE NEOLITHIC TRANSITION IN THE IBERIAN PENINSULA: REVIEWING AND OLD QUESTION FROM NEW LABORATORY AND COMPUTATIONAL APPROACHES

Author(s): Gonzalez Fortes, Gloria - Tassi, Francesca (University of Ferrara) - Pajmans, Johanna - Henneberger, Kirstin (University of Potsdam) - Barroso, Cecilio (Fundacion Instituto de Investigacion de Prehistoria y Evolucion Humana) - Grandal D'Anglade, Aurora (University of A Coruna) - Hofreiter, Michael (University of Potsdam) - Barbujani, Guido (University of Ferrara)

Presentation Format: Oral

In this study we investigated the demographic impact of the Neolithic transition in the Iberian Peninsula by combining cutting edge technologies in ancient DNA studies and statistical inference methods. The Neolithic was a major revolution in human prehistory, as human populations moved from a nomadic hunter-gatherer (HG) way of life to sedentary communities living on farming and agri-

culture. It was a global process that spread fast from Near East into Europe by a combination of cultural and demographic events. In a general picture, recent studies have showed that in south and central Europe it was mainly mediated by migration and admixture between pioneering farmers and local HG, while in the north and northeastern latitudes, a cultural diffusion seems to have played a major role. In our study we investigated the dynamics and demographic effects of the Neolithic transition at local scale. We samples ancient human remains in north and south of the Iberian Peninsula and based on whole genome data and 14C dates, we have investigated the times, modes and demographic sources of the Neolithic diffusion at the two westernmost shores of Europe: the Atlantic and Mediterranean areas in Iberia.

Our results show a different genome background in samples from the North and South of the Iberian Peninsula, which could be explained by a combination of: 1) a different rate of admixture with the pioneering farmers; and 2) the pre-existence of some genetic structure in the Iberian populations before the Neolithic transition.

09 BAYESIAN APPROACH IN THE NEOLITHIC STUDIES - REMARKS FROM POLISH LOWLAND

Author(s): Kozička, Magdalena (Institute of Archaeology, Nicolaus Copernicus University in Torun)

Presentation Format: Oral

Archaeology has been applying Bayesian statistic for more than twenty years. It is a well-known and irreplaceable tool when one wants to create a more precise absolute chronology for a researched site or process. Especially for prehistorians who deal on daily basis with millennia or, when lucky, centuries. As practice shows, radiocarbon dates turns out to be the most convenient for this.

Although there are many weak points in the radiocarbon dating itself, as well there are a few restrictions when applying Bayesian modelling, without them research on, for example, the spread of the Neolithic would not be possible. In case of the study of the Neolithic of the Polish Lowland, there is one more shortcoming – the deficiency of sites dated with a usage of absolute dating methods in some regions. Also, not all archaeological structures are sufficiently dated.

Nevertheless, it is possible to track the spread of the Neolithic on the Polish Lowland as well as separate, distinguishable components. Granting all this, engaging Bayes' Theorem within archaeological discourse may help researchers to assess an accuracy of their own presumptions built on basis of varied materials – further change their view on the past occurrences. On the one hand – by being applied to build a precise chronology of recorded events – but also by letting us distinct inaccurate assumptions.

10 EXPLAINING VARIATION IN THE SCALE OF NEOLITHIC QUARRY AND MINE PRODUCTION

Author(s): Schauer, Peter - Shennan, Stephen - Parker-Pearson, Mike (UCL Institute of Archaeology) - Kerig, Tim (University of Leipzig) - Edinborough, Kevan - Bevan, Andrew (UCL Institute of Archaeology)

Presentation Format: Oral

In recent years new methods have been developed for using summed radiocarbon probabilities as a population proxy and for comparing radiocarbon datasets to establish whether they are significantly different from one another, while taking into account sampling variation and the patterns in the calibration curve. On the basis of newly collected and updated radiocarbon data on the dating of Neolithic mines and quarries in in Britain, Ireland and continental Northwest Europe, the paper will present the results of using these methods to compare the chronological distribution of mine and quarry exploitation with regional fluctuations in the population of early farmers and in the scale of forest clearance that they undertook, to test the hypothesis that the intensity of production depended on variation in the demand generated by the population and its clearance activities. It will do this by simulating large numbers of mine date samples on the assumption that they represent random samples of the population and clearance distribution and comparing these with the observed distribution. We then compare radiocarbon data with pollen data to explore correlations between population change, activity at mines and quarries and changes in indicator species, including evidence for agriculture, in Britain, Ireland and Northwest Europe.

11 THE DIFFUSION OF NEOLITHIC HARVESTING TOOLS INTO THE MEDITERRANEAN AREA, DEMIC DIFFUSION OR CULTURAL INNOVATION?

Author(s): Capuzzo, Giacomo (Quantitative Archaeology Lab - LAQU), Department of Prehistory, Autonomous University of Barcelona) - Mazzucco, Niccolò (UMR 7055 «Préhistoire et Technologie», CNRS/Université Paris Nanterre) - Ibañez, Juan José - Gibaja, Juan Francisco (Institució Milà i Fontanals, Spanish National Research Council - CSIC)

Presentation Format: Oral

Harvesting tools are an important source of information on agricultural systems, indeed as agriculture began to spread into the Mediterranean basin around the end of the 8th millennium BC, Neolithic groups brought domesticated crops to new regions together with a complex set of technologies and knowledge necessary to cultivate, harvest, store, process and consume them. Harvesting tools were definitely one part of this package.

The concept of wave of expansion for describing the spread of the early farming in Europe was introduced by Ammerman and Cavalli Sforza at the beginning of the seventies, the Neolithic would have expanded from East to West following a homogenous space-time pattern. In recent years, new researchers have highlighted the variability which characterizes Neolithic harvesting traditions, trying to relate it to different routes of expansion followed by the colonizing groups, suggesting the existence of at least three waves of expansion across Europe: the Linearbandkeramik route towards central and northern Europe, a maritime route along the Tyrrhenian

coasts and a land route along the northern Mediterranean basin.

In this paper we focus on the diffusion across the Mediterranean basin of two different harvesting traditions, one characterized by curved sickles, the other characterized by reaping knives with parallel hafted blades. Thanks to the crono-statistical and the geo-statistical analysis of a dataset composed of 42 ¹⁴C dates associated to the two sickles types recovered in a large territory, including Greece, Dalmatia, the Italian Peninsula, Southern France and the Iberian Peninsula, we have been able to shed light to this processes of innovation and change, detecting patterns in space and in time. In particular, we aim to clarify the chronology of both types through Bayesian analysis, to detect their time-span of maximum development and to explore their mechanisms of spread across space and over time.

12 A COMPUTATIONAL METHOD FOR MODELING TRANSHUMANCE PATTERNS AMONG NEOLITHIC FARMERS IN DALMATIA, CROATIA

Author(s): Triozzi, Nicholas (Penn State University) - McClure, Sarah (Penn State University) - Podrug, Emil (Sibenik City Museum) - Ebert, Claire (University of Pittsburgh) - Kennett, Douglas (Penn State University)

Presentation Format: Oral

Ongoing archaeological research and stable isotope analyses of faunal remains suggest that animal transhumance was a key economic development for Neolithic (6000-4500 BC) farming communities living on the Dalmatian coast of Croatia. Ethnohistoric and ethnographic accounts of livestock transhumance from the low-elevation pasturelands along Dalmatian coast to the Dinaric Alps in Bosnia indicate that the long-distance movement of livestock continued important to pastoralist economies through the 20th century. Framed by ecological niche construction theory, we present a computational method for identifying environmental impacts along a distinct habitat created by the sustained use of traditional transhumance routes using partial and spectral analyses of remote sensing data. Vegetation and productivity indexes provide month-to-month temporal resolution to model seasonal changes in suitability of pasturelands along documented historic transhumance routes. Our model also combines estimates of travel time from lowland to high-altitude grazing areas based on pastureland depletion rates given herd composition and size and livestock dietary requirements. The results of this study will be useful for predicting the isotopic signatures and other archaeological correlates of transhumance patterns among farming societies worldwide characterized by a high degree of environmental dependency. We will also consider the ways in which sustained human-animal systems continue to impact modern environmental conditions in Dalmatia.

13 MODELLING THE SPREAD OF LITHIC TECHNOLOGIES IN WESTERN ANATOLIA AND AEGEAN DURING THE NEOLITHIC - ARCHAEOLOGICAL BACKGROUND AND DATA PROCESSING METHODS

Author(s): Milić, Bogdana (Institute for Oriental and European Archaeology - OREA, Austrian Academy of Sciences) - Timpson, Adrian (Genetics, Environment and Evolution - GEE, University College London - UCL) - Horejs, Barbara (Institute for Oriental and European Archaeology - OREA, Austrian Academy of Sciences) - Thomas, Mark G. (Genetics, Environment and Evolution - GEE, University College London - UCL)

Presentation Format: Oral

Following the lithic technologies and trends in knapping involving innovations through the application of new techniques from the Near Eastern Pre-Pottery Neolithic, investigation of the chipped stone assemblages in the Aegean informed about the appearance of pressure technique for blade making and its rapid spread throughout the region in the 7th mill. BC (Milić, Horejs 2017; Perlès 2001; Binder et al. 2012). Based on technological aspects and knowledge involved in producing blades in this specific way, it is suggested that the technique arrived from elsewhere due to contrasting evidence from the pre-Neolithic sequence concerning the Mesolithic period (9-8th mill. BC), with the hypothesis of the spread alongside the first farmers in Western Anatolia. In addition, the exchange of obsidian as raw material and in forms of ready-made products could have had a significant role in the spread of the technical know-how on regional levels.

A new pilot study was initiated to address the question concerning the origins of lithic industries in the 7th mill. BC western Anatolia and Aegean through the model-based computer simulations. For the purposes of the project, chipped stones datasets, studied first-hand by the first author and those collected from the published record, directly related to radiocarbon dates and site locations will be used to form necessary parameters for further data processing. The modelling part of the study employs a range of techniques, with Generalised Linear Models (GLMs), Bayesian network analysis, and the Phylogenetic Comparative Method, as preliminary suggested.

Due to the recent start of the project, this paper seeks to present the project framework and first steps involved in the study regarding the quality assessment of the data and methods applied in data collecting. Depending on the progress of analysis preliminary results will be outlined.

14 IDENTIFYING THE INFLUENCE OF NEOLITHIC AGRO-PASTORAL LAND-USE ON HOLOCENE FIRE REGIMES THROUGH SIMULATED SEDIMENTARY CHARCOAL RECORDS

Author(s): Snitker, Grant (Arizona State University)

Presentation Format: Oral

Archaeological and paleoecological studies demonstrate that human-caused fires have long-term influences on terrestrial and atmospheric systems, including the transformation of "wild" landscapes into managed, agricultural landscapes. Throughout Europe,

the emergence of Neolithic land-use likely contributed to the earliest, broad-scale changes in fire regimes, resulting in changes in vegetation community composition and distribution. However, a mismatch between available archaeological data on early agro-pastoral practices and paleoecological data on fire history and vegetation change make the relationship between Neolithic farmers and landscape change difficult to interpret. Computational modeling offers a new approach to anthropogenic fire that links social and biophysical processes in a “virtual laboratory” where long-term scenarios can be simulated and then compared with empirical data. This paper applies the Charcoal Record Simulation Model (CharRec) to empirical sedimentary charcoal records from three study areas in eastern Spain. Ultimately, this research serves to evaluate the degree to which specific Neolithic agro-pastoral burning practices, including fire spatial distribution, frequency, size, and intensity, may have influenced fire regimes during the Holocene. With the emerging interest in tracing the prehistoric roots of the Anthropocene, computational models in archaeology are becoming increasingly more important in answering the difficult and often tangled questions regarding the feedbacks between humans and their environments in long-term-social ecological systems.

15 VEGETATION TRANSFORMATION DURING THE EUROPEAN NEOLITHIC: THE EFFECTS OF AGRO-PASTORAL SUBSISTENCE ON PLANT COMMUNITIES IN EUROPE

Author(s): Bergin, Sean - Snitker, Grant (School of Human Evolution & Social Change, Arizona State University)

Presentation Format: Oral

The spread and adoption of agro-pastoral subsistence in Europe has long been recognized by archaeologists as a transformative social and economic event. Furthermore, researchers have documented the ecological impact that early agricultural communities had on their surrounding landscapes. As a whole, paleoecological records indicate increases in charcoal abundance and changes in vegetation communities' distribution or diversity related to Neolithic agricultural land clearing, burning, or pastoral activities. Yet, most research on the paleoenvironmental impact of Neolithic agropastoral systems have been limited to site-based or regional analyses - without a full understanding of the impact of Neolithic land-use across multiple ecological regions. To better understand the ecological impact of the Neolithic transition as a whole, we examine the spread of agriculture and its influence on the pollen record for continental Europe.

In this paper we utilize a piecewise regression method to identify significant ecological shifts in the pollen record and compare these results with the spread of agro-pastoral subsistence across the European continent. We utilize a database of over 5,000 radiocarbon dates from Neolithic contexts throughout Europe and a comprehensive pollen dataset adapted from the European Pollen Database. From these data, we construct and statistically compare early Neolithic chronology and major vegetation transformations to track the pace and intensity of ecological change in Europe due to the initial shift to agro-pastoral land-use.

16 'DIGITAL PROXIES' FOR VALIDATING MODELS OF PAST SOCIO-ECOLOGICAL SYSTEMS IN THE MEDITERRANEAN LANDSCAPE DYNAMICS PROJECT

Author(s): Barton, C Michael (Arizona State University) - Ullah, Isaac (San Diego State University) - Gauthier, Nicolas - Miller, Nari - Snitker, Grant (Arizona State University) - Esteban, Irene (University of the Witwatersrand) - Bernabeu Auban, Joan (Universitat de València) - Heimsath, Arjun (Arizona State University)

Presentation Format: Oral

Validation is key to assessing the usefulness of a model. Ironically, the richness and sophistication of spatially-explicit agent based or cellular models of past socio-ecological systems makes them particularly difficult to validate. This is because such models commonly produce results in the form of high-resolution, multidimensional, digital landscapes that can include locations of simulated land-use, human settlement, vegetation communities, soils, topography, and more. But we cannot directly observe past human and natural system processes to validate these models, and instead must rely on proxy data to infer the processes represented.

Proxies for past socio-ecological systems include samples of sediments and soils, plant micro- and macro-fossils, discarded artifacts, and cosmogenic radionuclides. Such proxy records tend to be incomplete, sparsely preserved, collected from a limited number of points on the landscape, and often at multiple depths below the surface. Even converted to digital form, the great differences between empirical proxies and model results make direct comparisons impossible, creating important challenges for model validation.

To address the incommensurability between our models and the empirical data available to validate them, the Mediterranean Landscape Dynamics Project (MedLanD) has developed a validation instrument that creates a ‘digital proxy’ record based on model results. The digital proxy is analogous to extracting a digital core at specified points in the gridded, digital landscape. It simulates the accumulation over time of a proxy-like record for modeled human land-use, vegetation, landscape fire, and surface processes. Digital proxy ‘cores’ can be extracted from any point in the simulated world and compared directly with empirical samples taken from analogous points in real world landscapes, improving our ability to validate complex models. We present a brief overview of our digital proxy modeling method and provide a test case of comparing digital and empirical data from locales in Mediterranean Spain.

Theme: Museums and the challenges of archaeological outreach in the 21st century

Organisers: Linea, Jette (Moesgaard Museum) - Hall, Mark (Perth Museum & Art gallery)

Format: Regular session

Recent years have seen a swathe of new museums and heritage centres – including the Moesgaard Museum, Denmark and the Museum of Montegrotto Terme, Italy – opening and exploring aspects of Europe's past through a rich diversity of both sites and finds. In this session, the third in a series, we want to focus on the role of archaeological museums in shaping the historical context of a nation's identity and how the reflexes around new heritage and greater public engagement are/should be captured in museum spaces.

Museum professionals are increasingly experimenting with ways that public debate can be facilitated, to help give people space to consider and reframe their thoughts about a multiplicity of issues. Who is to set the agenda in a time where visitor numbers are crucial to museum survival? How do we navigate between what the public wants to hear, and what we think they need to hear? What stories do we want to tell the public, and how do we want to tell them?

For this session we want to encourage a Europe-wide response from a cross-section of recent projects. We want to hear about successes, failures and plans for the future to promote an holistic understanding. We also want to consider how the future might look for this critical practice that creates a space where science, curation and citizen engagement interact. We want to explore scale, diversity, purpose, financing, community engagement, local vs tourism and archaeological value through case studies as well as thematic papers.

ABSTRACTS

01 INTRODUCING SOME OF THE CHALLENGES FROM A UK AND DANISH PERSPECTIVE

Author(s): Hall, Mark (Perth Museum & Art gallery)

Presentation Format: Oral

In this extended introduction to the session, 'Museum presentation in a challenged world', the session organisers will seek to contextualise the diverse range of papers on offer by considering what some of the challenges to museum archaeology are and could be, both now and in the future, drawing on their respective experiences of museum archaeology in the UK and in Denmark.

A non-exhaustive list of questions/issues to be raised so as to inform the session presentations and their discussions include:

- The future role of communities in co-determining collecting & research strategies and exhibition content
- The future role of digital technologies in extending the reach of museum displays and interpretation and facilitating wider engagement and co-authorship/curation (some recent examples include coping with large-scale infrastructure projects and re-visiting of decades old excavation archives)
- The necessary base level funding of public institutions so that they can flourish and be successful
- The greater integration of different archaeological constituencies in a public facing archaeological process with a shared professional outlook and ethos
- What is the role of the museum in shaping a nation's sense of itself or a community's sense of itself: are these two sides of the same coin?

We hope and of course look forward to the many questions for debate the contributors and their audiences will bring to the session.

02 ELUSIVE PHOENICIANS: PERCEPTIONS OF PHOENICIAN IDENTITY AND MATERIAL CULTURE AS REFLECTED IN MUSEUM RECORDS AND DISPLAYS

Author(s): Sassine, Lamia (University of Sheffield)

Presentation Format: Oral

The project aims to investigate the part played by different historical and modern perceptions of Phoenician culture and identity in the presentation and interpretation of what is (and has been over the last 100-150 years) regarded as Phoenician material culture in different Mediterranean and European museums. Given the chequered history of perceptions of Phoenicians in different national and intellectual contexts from antiquity until relatively recently, it seems likely that perspectives to what constitutes objects of Phoenician material culture will also have varied from place to place and from time to time. The research is based on an appreciation of accounts of, and attitudes to, Phoenicians from antiquity onwards, which have undoubtedly fed into more modern European views. This will be gained from key ancient (Greek, Roman and Biblical) sources, as well as more modern (especially 19th and 20th century) European writings, both literary and archaeological/historical. The core of the research focuses on museum displays and records pertaining to Phoenician material culture. Museum displays and archives are investigated to see what is identified as Phoenician, why it is identified as such, and how it is interpreted, as well as whether views of what is Phoenician have changed over time. The aims, in short, are to gain a better understanding of the history of perceptions of Phoenician identity and how these have affected identification and presentation of Phoenician material culture in museums.

03 MULTIMODAL MUSEUMS IN THE DIGITAL WORLD: A COMPARATIVE ANALYSIS OF POLICIES AND EXEMPLARY CASES IN GREECE, SPAIN AND CYPRUS

Author(s): Giannoulis Giannoulopoulos, Georgios (Universidad Pompeu Fabra; Foundation of the Hellenic World) - Pujol, Laia - Collins, Ricardo (Universidad Pompeu Fabra)

Presentation Format: Oral

The EU-funded project Virtual Multimodal Museum (<http://www.vi-mm.eu/>) aims at understanding and promoting the needs and motivations of stakeholders in the field of Digital Cultural Heritage. We understand "Virtual Multimodal Museum" as an organizational structure that manages and presents curated collections by means of digital technologies alone or combined with physical objects and archaeological sites. Within this framework, we have undertaken a mapping of the institutional, social, and economic environment of ViMMs in three different countries: Spain-Catalonia, Greece-Northern Macedonia, and Cyprus. These regions have very important cultural assets and significant tourism flows, but also diverse policies for Cultural Heritage appreciation, community objectives, and methods of citizen engagement.

In our speech, we will present the main conclusions of a comparative study. The investigation considered two levels: the "macro" level, which corresponds to community policies, priorities, objectives, incentives, and resources; and the "micro" level, in which we chose several representative digital cultural heritage projects and analyzed the design process, objectives, stakeholders, community engagement, and effectiveness. At EAA, we will focus on three main aspects. Firstly, the characterisation of the overall objectives of the stakeholders and policy makers as reflected in the official plans for local development through digital strategies. We will pay special attention to the relationship with the tourism industry, identity, and branding. Secondly, the identification of obstacles and the specific strategies adopted to overcome them. The strong points in the stakeholder policies will be established as benchmarks. Thirdly, the definition of priorities and synergies that by means of an effective standardization of the decision-making process in digital projects would help reduce costs, obtain higher returns on investment (public and private), and implement sustainable business plans.

Our final aim is to propose guidelines for archaeologists and Cultural Heritage professionals who wish to engage in the design and implementation of a Virtual Multimodal Museum.

04 THE ARCHAEOLOGY MUSEUM OF CATALONIA AND THE APPLICATION OF THE NEW TECHNOLOGIES IN MUSEOGRAPHY

Author(s): Torres, Josep Manuel (Museu d'Arqueologia de Catalunya)

Presentation Format: Oral

New technologies are affecting the concept of museum and exhibition. The experiences that prevail are the immersive ones, the visitors need to live in a credible way the past. However we have to talk about different ways. In MAC, the techniques we use are related to the archaeological sites and the one's that will be implemented this year in museums.

In the archaeological sites, MAC, is considering the virtual recreation of the physical spaces. In that virtual reality, like the one made for the Iberian site of Ullastret, the visitor can walk along the streets, get inside the houses and even sailing. In the roman town of Empúries, we observe an interesting proposal in the cryptoporticus, of one of the main domus of the archaeological site. It is a virtual staged tour, which has its highest point in the tour to the house seen in the cryptoporticus. It is a detailed work that is shown in a three dimensions virtual reality.

In the museum headquarters, in Barcelona, a museum tour is being prepared with 8 stopping points. This project will take us, through a tridimensional reality | 360º, to the original archaeological site of the selected objects, only in three cases we would be able to watch virtual recreations in 3D. Finally, in the circus mosaic a mapping will be installed, to create theatricality, dynamism, and, ultimately, to give life to the mentioned mosaic.

At the moment, this is a timid incorporation of new technologies related to museums, since we don't want to misuse them and lose the message and the information that the original object conveys. The results of this experiences will help to evaluate the future role of this technologies in the museum.

05 MUSEUM OF TILES IN THE NEW JERUSALEM MONASTERY

Author(s): Glazunova, Olga (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Tiles were an important part of the material culture of Russian in the 17th -18th centuries, an element of national identity. With the example of New Jerusalem, it is particularly clear that national forms of cultural handling are incomparably more important than copying. The Christian world of the West and the East, having met here, gave birth to mixed Moscow-European art. The birth of previously unprecedented artistic forms on Russian soil is our common heritage with Europe.

The place is not chosen by chance. It was here that the pottery and tiled workshop worked for almost two centuries.

A relatively small exhibition has several sections. The authors wanted to show authentic architectural tiles of the original decoration of the Cathedral, various sets of tiles from the ovens, the kiln for tiles saved in situ, the technology of tile production, the unique personal seal of the master, the unique ceramic icon of "Christ Pantocrator", the continuation of tile craft at the present stage: new

tiles, copies of historical intended for restoration of tiled decor of the Cathedral and reconstructed the monastery ovens. All the items shown at the exhibition are genuine and found (except new model tiles) in the New Jerusalem monastery as a result of many years of work of the new Jerusalem archaeological expedition of IA RAS. The exhibits demonstrate the place of the New Jerusalem as a source of new technologies and styles, which determined, among other things, the new place of the tiles in culture of Russia. The exhibition gives an idea of the richness and diversity of Russian tiles, demonstrates its various types, features of historical manufacturing technology. All exhibits are authentic and exhibited for the first time.

06 A NEW METHODOLOGICAL APPROACH FOR EDUCATIONAL ARCHAEOLOGY: A CONSIDERATION ON THE ITALIAN STATE-OF-ART IN SEARCHING FOR AN EDUCATIONAL POLICY

Author(s): La Terra, Lia (Independent researcher)

Presentation Format: Oral

Involving different public of different age in archaeology has been a real issues in the recent years, that has led archaeologists to pay more attention on pedagogical matters. Many of the pedagogical approaches in Archaeology are based on the concept of learning by doing and the developing of the sense of touch that find their roots in constructivism.

This tactile pedagogical approach had been previously highlighted in the early nineteenth century by many pedagogists involved in special needs, among all Montessori, pedagogist that was never taken into account in the archaeological sector. This methodology could add to the constructivist "learning by doing experience" a strict knowledge of children developing skills possibilities: it can systematize archaeological activities into something more structural, following an order connectible with the needs of the child. The method has also a visual approach concerning maths and grammar that can be transferred to the notion of time, and the first Cosmic Tales can be the starting point to think new materials where archaeology can be a central part of them. It could be an extraordinary challenge for developing a scientific educational approach for Archaeology. This paper, starting from an anonymous survey sent to the main national museums and museum educators that operate in Italy, claims to analyze the italian state of Arts in developing strategies in archaeological education sector, pointing out the need of a shared educational policy and trying to motivate the potential of paths that have never been mapped out.

07 AN EXHIBITION ENTITLED: "UMA HISTÓRIA ENGARRAFADA: O VIDRO UTILITÁRIO DO SÉC. XVIII EM ALMADA"

Author(s): Coutinho, Inês - Vilarigues, Márcia (Department of Conservation and Restoration, FCT NOVA, Lisboa; Research Unit VICARTE, Vidro e Cerâmica para as Artes, FCT NOVA, Lisboa) - Pequito, Luís (Câmara Municipal de Almada; Instituto de História Contemporânea - Centro de Estudos em História e Filosofia da Ciência - Universidade de Évora)

Presentation Format: Oral

Museums play a key role on the dissemination and outreach of archaeological assemblages to general public. When dealing with glass archaeological sets excavated in Portugal, its dissemination acquires extra importance, since until a few years ago, glass sets were seldom studied.

During an archaeological intervention performed in a private house in the city of Almada (Rua Latino Coelho, n. 3-7, Almada-Museu de Arqueologia e História Local/Divisão de Museus e História Local/ Câmara Municipal de Almada), a significant set of ceramics, porcelains and glass fragments was unearthed from a closed area of the house structure, believed to be a well. Focusing the glass, it is mainly composed by wine glass bottles and a large variety of colourless drinking glasses presenting gilding, engraving and cutting decorations. When the work of conservation and restoration of the glass set was initiated by a group of master students (Master in Conservation and Restoration, Department of Conservation and Restoration, FCT/UNL), the challenge to create an exhibition in the Almada City Museum and later in the exhibition room of the FCT Library was made. This exhibition aimed to show the archaeological glass assemblage focusing the wine glass bottles (exploring its history and usage), what was learned from the preliminary observation of this rich set, and finally creating the need of a further research to be developed around the archaeometric investigation of these objects.

This exhibition aimed to bring to light an incredible glass set, where different ways to present the materials, its making processes and its presence in the everyday life of past generations were proposed and showed. The exhibition was designed and meant to stress out the importance of returning the acquired knowledge to the society, being of paramount importance and a social duty to share this knowledge outside the academic world to the general public.

08 TIRPITZ 1 - THE CHALLENGE AS AN OLD ARCHAEOLOGIST TO MAKE A BRAND NEW MUSEUM

Author(s): Frandsen, Lene (Vardemuseerne/Tirpitz; ArkVest - Arkæologi Vestjylland)

Presentation Format: Oral

TIRPITZ transforms a dune and a German WWII bunker into a new museum complex, comprising four exhibitions within a single structure, seamlessly embedded into the protected shore lands of Blåvand in western Denmark. Tirpitz is a step on the way towards changing Vardemuseerne from 14 local museums to fewer high quality museums of national and international standards.

The goal was to create a world-class attraction, which could surprise its visitors with new perspectives on the majestic landscape. To get people who rarely visit museums to spend precious holiday hours in the exhibition to uncover the hidden stories and make

their own discoveries.

As responsible for the amber exhibition "The Gold of the Sea" it has been great fun, but also very challenging to work together with world-famous architects and designers, who have fantastic ideas on how to build exhibits and tell stories, but not always have the understanding of how fragile artifacts are and how important true fact are. As an example – all archaeologist know that amber is very sensible to daylight, but the architect sees the natural light as the visitor's advantages, because they stay longer when there is daylight – so we have spend long time to find the right solution – enjoyable for the visitor and acceptable for the amber. The other great challenge has been to nearly give up written text and instead use audio guides. In this paper, I will try to explain how we created a museum for all kinds of visitors – from nerds to five year-olds. In the amber exhibition we tell the story of amber by showing different original objects: raw amber, inclusions, prehistoric artifact and modern items, but also using modern audiovisual effects.

09 TIRPITZ 02 – WE ARE NOT THE VISITOR!

Author(s): Andresen, Stina (Vardemuseern/Tirpitz; ArkVest - Arkæologi Vestjylland)

Presentation Format: Oral

Tirpitz, situated in the western part of Denmark, opened in June 2017. It consists of four different exhibitions, each with different target groups. One of the exhibitions West Coast Stories tells 20,000 years of Danish west coast history. The main target group here is people who seldom or never visit museums. In the exhibition, the visitors are challenged to uncover the hidden stories and make their own discoveries. The exhibition strives to make a clear connection between the archaeological and historical artefacts, their stories and the landscape outside the museum. Every half hour the exhibition turns into a 4D theatre, which takes the visitor on a tempestuous journey through time.

The learning styles of e.g. Howard Gardener and Alex Burch, and the motto "We are not the visitor", were a focal point for choosing stories, design and effects. An example is deselection of touch screens in favour of comprehensive use of projections to support a social experience. Digital technology is an important facilitator but is never on the forefront.

User experience design was used prior to planning the exhibitions. It involves the process of enhancing user satisfaction with a product by improving the usability, accessibility, and pleasure provided in the interaction with the product. Proceeding the exhibition work, we made surveys of both existing visitors and non-visitors on the site, which were used to define six different target groups in the four exhibitions. By reaching out to different groups of people and bringing their experiences and ideas into the planning, we strived to make the archaeological and historical stories and objects easily accessible to people who seldom visit museums.

10 THE MOESGAARD STYLE: EXPERIENCES FROM CURATING A PERMANENT EXHIBITION IN A NEW MUSEUM

Author(s): Linaa, Jette (Moesgaard Museum)

Presentation Format: Oral

Moesgaard Museum is the among the largest archaeological and ethnographical museums in Denmark. Our exhibition hall, a 80 mill euro project that opened in 2014, is the frame of five permanent exhibitions of primarily Danish archaeology from the first immigrants 10.000 years ago to the Early Modern period. while temporary special exhibitions highlights international research, lately in exhibitions featuring China's first emperor Qin Shi Huang and his terracotta army. Designed by Henning Larsen Architects, the exhibitions hall has won several international rewards, lately the architizer A+ award AA. The last of the five permanent exhibitions, the Middle Age, opened in October 2017. Currently the permanent exhibitions centered on the Bronze Age, Iron Age and Viking Age is open, while the permament exhibitions of the Stone Age and the Middle Age is under preparation. The aim of this paper is to present a curators view on how we planned this addition to the permant exhibition, and how our exhibition style aims to engage the audience through five carefully planned levels of interaction with the audience. The paper will focus on the interaction between hall and display, including reflections on scale and purpose, process and selection of topic and modes of display as a way of engaging both the community and our international visitors.

151 BOUNDARY BODIES: CRITICALLY THINKING THE BODY IN CONTEMPORARY (OSTEO) ARCHAEOLOGY

Theme: Theories and methods in archaeological sciences

Organisers: Ion, Alexandra (McDonald Institute for Archaeological Research, University of Cambridge) - Nilsson Stutz, Liv (Linnaeus University)

Format: Regular session

The archaeological study of human remains has long suffered from a divide between scientific and cultural/embodyed discourses with only a few explicit attempts to bridge it. In this session we propose to position the human body at the centre of this divide, as 'boundary bodies', and explore how scientific and theoretical propositions intersect on the territory of the body. This effort is articulated with a critical reflection on some of the latest scientific, theoretical or technical advances in the field of human remains research in (osteo)archeology. From a 'DNA revo-

lution', to the digitisation of the dead, from advances in archaeoethanatology to the appearance of new sub-disciplines, such as biohistory, our field has been lately marked by new questions and ethical and methodological concerns. Following on from some recent scholarship focused on the conditions of knowledge production on past human bodies (Crossland and Joyce 2015; Nilsson Stutz 2016; Stojanowski and Duncan 2017), we aim to dismantle the illusion that this knowledge is a straightforward matter, and instead link it to the fields of ethics, law, heritage, and cultural anthropology.

We welcome thought-provoking contributions that critically engage with the archaeological body and its deposition context, and the impact of latest theoretical or methodological strands (e.g. from the challenges of biohistorical investigation, posthumanism, to the dead in the digital realm, the implications of hard sciences investigations, or the divide death/burial archaeology). This session will run together with the more practically inclined 'Manipulated bodies: Case studies of post-mortem interactions with human remains' session.

ABSTRACTS

01 DO WE HAVE A BIO-POWER PROBLEM IN ARCHAEOLOGY

Author(s): Nilsson Stutz, Liv (Department of Anthropology, Emory University; Linnaeus University)

Presentation Format: Oral

Archaeology can be said to conduct biopower by proxy, using the remains of the dead to tell stories about the past that have implications for people in the present. As a discipline we have undergone significant internal and external critique, especially in the debates concerning repatriation and reburials of human remains in colonial and post-colonial contexts. This paper seeks to push the examination into another realm and examine the relationships between sub-disciplines of the archaeology of the body.

The new scientific revolution in archaeology has brought significant and important methods and theories that have allowed to anchor our interpretations in the empirical evidence. This is extremely important and has contributed to significant growth of our understanding of the past. But can there be too much of a good thing? This paper seeks to draw our attention to a changing relationship between the researcher and the people of the past whose remains we are studying. Are we seeing a return to a dehumanization of our sources, reducing the dead human beings to source materials? Is there a connection between this powerful trend in the field with the equally impactful decentering of humanity in contemporary archaeological theory? Departing from the concept of biopower, this paper critically examines the scientific turn in archaeology and calls for a new form of anthropocentric archaeology of the dead.

02 NECROAGENCY

Author(s): Domanska, Ewa (Department of History, Adam Mickiewicz University in Poznan)

Presentation Format: Oral

Empowering human dead body and remains and finding evidence for what I call "necroagency" is something that I consider an important aspect of research conducted within "dead body studies." Therefore in my paper, I will explore what human dead body and remains do and how they act. While John Robb, who in his analysis of disputes in archaeology over agency states that "in many ways, we are beyond agency," I would rather discuss how to redefine agency and locate it within other interpretive frameworks that would enable research on dead bodies/remains beyond the paradigm of social sciences and a general human (anthropocentric) history that is concentrated on culture, politics and society. The approach that I will propose, is grounded in the assumption that the dead body/remains should be considered as agents that make an essential contribution to the creation and development of both human cultural history and also natural history. Dead bodies and remains are framed here by two senses of agency: passive agency, i.e. the ability to effect changes in the socio-cultural world (through historical necropolitics, for example), and active agency, meaning having an impact on the environment (through, for example, the influence of the presence of decomposing remains in the ground on the chemical composition of groundwater and soil). I will try to show how humanities (with its cultural determinism) reduces our understanding of dead body and remains and I will call for complementary and holistic understanding of this phenomenon.

03 EMERGING OPPORTUNITIES AND CHALLENGES IN FORENSIC BIOHISTORY

Author(s): Duncan, William (Sociology and Anthropology, ETSU) - Stojanowski, Christopher (School of Human Evolution and Social Change, ASU)

Presentation Format: Oral

The last 10 years have seen an increase in high-profile historical forensic cases in the popular press, an area of investigation called forensic biohistory. This area typically involves efforts to positively identify the famous dead (such as the case of Richard III), or to characterize matters of facts surrounding famous historical remains (Mozart's cause of death) or historical events (such as the Donner party and the Mountain Meadows Massacre in the Western United States). Although situated between forensic anthropology and osteoarchaeology (bioarchaeology as defined in the United States), forensic biohistory remains undertheorized and underconsidered as a locus of investigation in its own right. Such consideration is worthwhile however because forensic biohistory offers a unique opportunity for anthropologists to engage the public. Bodies of the famous dead serve as boundary objects through which various interested parties (including scientists) intersect. This potential is, however, coupled with a unique set of ethical challenges that researchers must face because frequently we are asked to serve as arbiters and judges of the validity of narratives surrounding

the bodies in question. In this presentation we discuss forensic biohistory as a distinct area of research and highlight some of the potential opportunities and challenges that define it as a whole.

04 DEATH, DNA AND PERSONHOOD: THE BIOETHICAL CONUNDRUM

Author(s): Sayer, Duncan (University of Central Lancashire)

Presentation Format: Oral

With rapidly advancing methodologies for doing ancient DNA research and interpreting past peoples, it is imperative that archaeologists consider the implications of biotechnology alongside an ethical trajectory for research within the contemporary scientific context. This paper will look at medical ethics and the body; it will explore the legal and cultural boundaries which exist between personhood and genomic identity. If the dead have personhood how and should their data be protected? How might it be misused? In medical ethics informed consent is of paramount importance in the collection, analysis and archiving of genomic data. However, this has limitations because of the potential impact that DNA has on relatives, at the same time online databases make anonymous DNA data widely available, but are the ancient dead anonymous and what implications are there for their living relatives. DNA research peers into the As Ts Cs and Gs that make up a person, and so do bones become people, research subjects or research objects, transformed by the process of doing research? This paper will consider how contemporary problems might apply to past people, particular in light of the rapidly emerging divisions between biological and cultural heritage, which are emerging within the popular and scientific literature.

05 OSTEOBIOGRAPHY AS A RESEARCH TOOL: DEVELOPING CONCEPTS TO GO WITH THE TERM

Author(s): Robb, John (University of Cambridge) - Hosek, Lauren (Syracuse University)

Presentation Format: Oral

Osteobiography is a term in search of a concept. The word is usually used to refer, in a common-sense way, to the reconstruction of life narratives from the skeleton; it is often understood as a way of adding "human interest" to skeletal data. But this understanding glosses over a lack of both conceptual development and methodology. For example, uncritical use of Western ontology means that we have traditionally separated biological studies of life from taphonomic studies of deathways, making it difficult to understand the ongoing social personhood of the dead. In this paper we review both the conceptual issues of osteobiography and the rapidly increasing range of potential methodologies for understanding lives from human skeletons. We argue that individual human lives have a complex relationship to normative concepts of age, gender and the life path on one hand, and to individual sequences of events conditioned by path dependency and contingency on the other hand. Moreover, as biological histories are normally structured by the time-ordered interplay of many factors rather than simply by one or two "variables", osteobiography can provide complex insights into both human lives and broader social patterns. We argue that osteobiography can go beyond providing human interest" stories about the past and provide an important new research tool for bioarchaeology.

06 THE BODY AS ITS OWN MONUMENT: HUMAN REMAINS AND GRAVE SITES IN ART AND PROTEST

Author(s): Renshaw, Layla (Kingston University London)

Presentation Format: Oral

This paper will focus on human remains, and sites of death and burial, resulting from recent conflict and atrocity. It will look at two related themes: the use of real human bodies or tissues in the construction of monuments, sites of mourning, public protests and artworks; the intensive generation of representations, media images and aesthetic readings that surround the scientific and archaeological investigation of recent mass graves. This paper seeks to problematize the distinctions between these two areas, and show the permeability between art, protest, and the scientific investigation of the recent dead. This raises questions of whether, and how, archaeologists should involve themselves in these different realms and what limits they can, or should, place on uses and representations of the human remains they recover and analyse. Related questions surrounding the perceived agency of the dead, the challenging of victimhood, and the degree to which scientific practices now constitute a form of postmortem care, and contribute to newly invented commemorative traditions will also be explored. This contribution will draw on both archaeological and ethnographic fieldwork on the exhumation of 20th century mass graves, including World War I and the Spanish Civil War, and reference a diverse range of geographical and temporal contexts, including the memorialization of the Holocaust, and deaths associated with Europe's contemporary migration policies.

07 THE BODY AS TEXT. THE CORPSES OF SOLDIERS OF THE GREAT WAR IN THE ALPS

Author(s): Nicolis, Franco (Archaeological Heritage Office - Autonomous Province of Trento - Italy)

Presentation Format: Oral

Archaeology of the Great War is not a common field of interest in Italy. However, in the alpine Trentino region (Northern Italy), which was part of the Austrian-Hungarian empire until 1918, the so called "White War" took place. This peculiar aspect of WWI was fought at very high altitudes, often above 3,000 metres, and even in the glacial environment.

Nowadays the consequences of global warming also include the increasingly frequent emergence of traces left by the impact of the war on alpine environments: large amounts of material abandoned by the armies facing each other but also corpses of soldiers.

The archaeological approach to this kind of evidence needs to find the right balance between scientific methodology and ethical issues which arise from the fact that we are excavating “identities” in the field of memory, though the great part of these identities are now *Namenlosen* (Walter Benjamin), unknown soldiers. According to Armando De Guio’s definition, this is an “archaeology of the grandfather”.

Some answers and reflections on how to cope with the problems related to the discovery of these “still disturbing bodies” will be presented. Moreover, some more thoughts will be devoted to the interpretation of bodies as “texts”, narrating not only their *curriculum vitae* but also their *curriculum mortis*.

08 THE ITINERARY OF THE HUMAN BODY. AN APPROACH TO THE BODY’S MATERIAL HISTORY

Author(s): Gramsch, Alexander (RGK - Romano-Germanic Commission DAI) - Grosskopf, Birgit (Historische Anthropologie, Universität Göttingen)

Presentation Format: Oral

The body’s nature is manifold: It acts and is acted upon, it is material and social, it is individual and dividual. Archaeology from early on directed much of its attention to graves and over the decades shifted from the concern with objects to a culture-historical approach understanding graves as ‘mirrors of life’ and to thanatoarchaeology as an anthropology of death and to the human body itself. In recent years a discourse emerged on the socially constructed and relational body. In this paper we propose to regain the body’s materiality. The body is more than metaphor, and its material history needs to be separated from the biography of the individual as a social being. We therefore suggest approaching the material history of the human body as an ‘itinerary’, separate from the socially understood ‘biography’ of the individual. The itinerary of the body describes how the body acted and was acted upon during the person’s lifetime. But it does not end with the biological death, also post-mortem manipulations are part of this itinerary. Using the human remains as a ‘bio-archive’ we present approaches to the study of macro- and microscopic data, discussing their potential for a joint archaeo-anthropological interpretation. Concepts to structure data on post-mortem interactions with bodies and body parts which we will suggest are, e.g., display and concealment, preservation and dismemberment, and we will present examples from various contexts highlighting how acquiring and structuring data according to such concepts may lead to a better understanding of post-mortem interactions with human remains.

09 ‘BONES’, ‘BODIES’ OR ‘DEAD BODIES’? THE PLACE OF OSTEOARCHAEOLOGICAL NARRATIVES IN RELATION TO ARCHAEOLOGICAL UNDERSTANDING

Author(s): Ion, Alexandra (McDonald Institute for Archaeological Research, University of Cambridge)

Presentation Format: Oral

In her seminal work ‘The Body as Material Culture’, Joanna Sofaer (2006) brought forth the distinction between the disciplines of osteology and funerary archaeology: while the first follows an empiricist, positivist tradition with interpretative model borrowed from the natural sciences, the latter focuses on past embodied beings, framed in cultural terms. 12 years later, both the fields of archaeology and osteology have undergone important developments, which challenge established analytical distinctions. Among these of particular interest is the development of new materialistic perspectives, from genetics and isotopes datasets which play a growing role in interpretation, to posthumanist perspectives. In this context even the notion of ‘body’ is re-imagined, from aggregates of molecules to open-ended assemblages. Therefore, with this paper I aim to ask what is the role we want to ascribe to osteoarchaeological projects in relation to the wider archaeological narratives? Often times osteoarchaeological data is viewed as an annex of the archaeological framework, a brick in the larger aggregation of data on a past context. However, it is my claim that osteoarchaeology has the potential of contributing to the refinement and expansion of archaeological understanding, but to do so it should move from describing phenomena, to interpreting their relationship within the wider socio-historical context- i.e. by identifying the causes underlying the phenomena we see. We are defined by our methods, and often limit ourselves to them, but there are more productive ways forward. To illustrate this point, I will take the example of taphonomical and archaeoanatomical data. These two are particularly pertinent to the interpretation of a specific category of funerary discoveries: human remains discovered inside Neolithic settlements. By critically discussing the limitations of employing such data- which label contexts as primary/secondary/ disturbed/re-opened etc., I hope to offer an alternative which actively engages with the agency of these remains.

152 COLLAPSE OR TRANSFORMATION? COMPARATIVE PERSPECTIVES FROM AFRICA AND BEYOND

Theme: Theories and methods in archaeological sciences

Organisers: Biagetti, Stefano (Universitat Pompeu Fabra) - Ashley, Ceri (University of Pretoria)

Format: Regular session

The rise and fall of complex entities is traditionally one of the most relevant topics of archaeology and history. Nevertheless, while the origin of complexity is implicitly linked with the idea of societal ‘progress’, the shift to looser structures is generally associated with ‘fall’, ‘collapse’,

and 'catastrophe'. But the end of complex societies leaves more than ruins buried by sand or vegetation, echoing past bustling life. The failure of societal structures does not imply the end of the societies that made them. The latter often transformed and adapted to new settings, embracing different and more flexible configurations. Recent scholarship has increasingly recognized the dynamic potential of such societal transformations, with for example, exciting discussions around resilience, consensus, and co-operation, as well as recognizing the dangers associated with a 'progressivist' view of political evolution that privileges a very rigid idea of what is 'complex' and what constitutes 'success'. These developments are particularly welcome and relevant for African research, where scholars have long celebrated the rich diversity of shifting social and political configurations that do not conform to traditional models of institutionalized hierarchy. However, Africa is rarely included in wider discourses, despite this huge potential. In this session therefore, we aim to address this by inviting speakers to reflect, rethink, and discuss societal transformation and complexities in Africa from the last three millennia, and ask non-Africanists to join the conversation, so that we might enhance our understanding of social dynamics, and bring the richness of the African past into a global spotlight.

ABSTRACTS

01 WHEN EMPIRES (DON'T QUITE) FALL: MALI AND KAABU

Author(s): Canós-Donnay, Sirio (University College London)

Presentation Format: Oral

The history of the Western Sudan over the last millennium is often presented as a succession of large empires and states interspersed with brief periods of regional fragmentation. While this sort of framework can sometimes be useful to provide a quick sketch of the region's political history, it also tends to obscure more complex –and interesting– histories of continuity, adaptation, and negotiation. A particularly striking, but rarely discussed, example is that of Kaabu, the westernmost province of the Mali Empire and its gateway to the Atlantic world. Although it is generally stated that the Mali Empire 'collapsed' in the 16th C, resulting in a period of decentralization, regional fragmentation, and looser political structures, this characterisation does not apply to Kaabu. Unlike other former provinces, Kaabu did not contract after the end of the Empire; on the contrary, it retained and expanded its territory, trade networks, and sociopolitical structures which continued in operation up until the 19th C. In this paper, I will draw from my own archaeological and ethnographic fieldwork, as well as from published oral traditions and European historical accounts, to explore the nature and complexities of this 16th C transition in the western Mali Empire, and of the continuities, discontinuities, and adaptations that characterised it.

02 DID GREAT ZIMBABWE COLLAPSE?

Author(s): Pikirayi, Innocent (University of Pretoria)

Presentation Format: Oral

Although settlement continued at Great Zimbabwe until the late 16th century, Portuguese written records attest to it being a pale shadow of its former self. There is no evidence suggesting violent destruction during the 15th or subsequent centuries, although there was conflict in the region due to gold mining and trade. The gold trade has long been regarded as the primary reason behind Great Zimbabwe's abandonment, and demise of its state. Events associated with the Little Ice Age have been considered not unlikely to have contributed to its demise, given Great Zimbabwe's extensive tributary system. However, this fails to fully account for Great Zimbabwe's demise. Written and oral records attest to population movement from the southern to the northern parts of the Zimbabwe plateau, pointing to shifts in political and state power, perhaps in response to environmental changes associated with the Little Ice Age. This demonstrates the resilience of the state in coping with the depletion of critical resources such as water. The large reservoirs ('dhaka' pits) within the central parts of the site point towards managing a water-stressed environment. Great Zimbabwe had to function as an integrated and complex ecosystem embedding urban, rural, natural and cultural dimensions - a system where monumental expression of power and social complexity was an integral part. In this system, understanding the changing cultural landscape context is vital in understanding Great Zimbabwe's built environment. It is within this context that gradual abandonment, rather than total collapse, became inevitable.

03 COLLAPSE, TRANSFORMATION, AND RESILIENCE IN THE LATE HOLOCENE SAHARA

Author(s): Biagetti, Stefano (Università Pompeu Fabra; University of the Witwatersrand) - Merlo, Stefania (University of the Witwatersrand) - Zerboni, Andrea (University of Milan) - Lancelotti, Carla (Università Pompeu Fabra)

Presentation Format: Oral

The 'African Humid Period' (AHP) indicates the Early to Middle Holocene climatic optimum that between 11-5.5 ka determined wetter conditions throughout the Sahara. The end of the AHP turned, either gradually or abruptly, the Sahara to its current arid conditions. This shift in climatic and environmental conditions marked the end of the last 'Green Sahara' stage, variably impacting past human societies. In the archaeological literature, the onset of current aridity, occurring at the end of the AHP, is traditionally linked to ideas of abandonment, demographic drops, and collapse.

Relatively recent research has nevertheless revealed trajectories of unexpected complexity, characterized by different responses to social and environmental stresses, in particular since the inception of the drier periods. In this presentation, we will provide an overview of cases of transformation, abandonment, adaptation, collapse and continuity, focusing on possible causes (not always

purely climatic) and implications for a better understanding of micro-dynamics in an ecologically adverse environment. We will focus on the latest prehistoric and historical trajectories, and will support our discussion with published archaeological and historical evidence against ethnographic sources and landscape characterization data obtained via remote sensing based analysis. We will ultimately discuss the notions of collapse, transformation, and resilience with reference to one of the most emblematic dryland of the globe.

04 THE KILWA ARCHIPELAGO AS AN URBAN CLUSTER

Author(s): Fleisher, Jeffrey (Rice University) - Wynne-Jones, Stephanie (University of York)

Presentation Format: Oral

The Kilwa archipelago is best known through the site of Kilwa Kisiwani, a large monumental Swahili town founded in the 9th century AD, rising to prominence in the first half of the second millennium. During this period, Kilwa was one of the most powerful among the dozens of Swahili towns that dotted the eastern African coast; a series of sultans ruled Kilwa Kisiwani and controlled the coastal gold trade. And yet, the Kilwa archipelago—which includes three islands—was home to a number of other important contemporary settlements, including the smaller sites of Songo Mnara, Sanje ya Kati, and Sanje ya Majoma. Research on these other sites has tended to focus on intra-site issues, while recognizing connections to nearby settlements through shared material culture such as local ceramics and coins. In this paper, we examine these sites together and argue that they formed an urban cluster, a tightly connected, integrated set of settlements. With occupation spanning the early 9th century to the present, this urban cluster underwent many significant transformations, punctuated by the emergence and decline of settlements in the 11th-12th centuries, and the 14th-16th centuries AD. Despite these transformations, we argue that the clustered nature of settlement in this region allowed for its endurance over the long term, and supported a complex set of socio-political, economic, religious relationships.

05 EXPENDABLE MONUMENTALITY: STONE WALLING AND NGWAKETSE EXPANSION IN SOUTHERN BOTSWANA BEFORE 1824

Author(s): Merlo, Stefania (University of the Witwatersrand) - Morton, Fred (University of Botswana)

Presentation Format: Oral

The Tswana occupation of Southern Africa in the later second millennium AD is associated with extensive stone walled sites after c.1600. To date interpreting such sites has emphasised the builders' origins or ethnicity. More recent approaches adopt the paradigm of historical ecology and regard stone walling as relatively short-lived monumental architecture that expresses the conquest of an occupied agro-pastoral landscape. Our case in point is the territorial expansion of the (Ba)Ngwaketse of southern Botswana beginning c. 1750. During two royal dynasties (Moleta, Makaba II) their constantly shifting bases were constructed using extensive stonewalling in varying layouts and levels of articulation. After securing their territory, the Ngwaketse stopped building in stone. The eventual permanent capital of Kanye, which in 1824 the LSM missionary John Moffat deemed the region's largest settlement, was defined by bush hedges. The disappearance of complex, large and permanent structures in a landscape could be interpreted as a sign of decline of power over a territory. Our archaeological and historical evidence demonstrates rather that complex, large and permanent structures were used during the process of appropriating a landscape and its people (including diverse groups). Once the appropriation and aggregation were completed, the functional use of stone walling as a territorial marker was no longer needed, and the Bangwaketse (alongside other Tswana speaking groups in the region) deliberately abandoned it. Thus, that which may appear in the archaeological record as a sign of abandonment and collapse is, in fact, the expression of a successful exercise of landscape domestication and territorial conquest

06 RETERRITORIALISING AND DETERRITORIALISING COLLAPSE IN THE HINTERLANDS OF SOUTHERN AFRICA'S FIRST STATE

Author(s): Ashley, Ceri - Antonites, Alexander (University of Pretoria)

Presentation Format: Oral

The Mapungubwe polity (c1200-1300AD) of southern Africa is widely regarded as the first state system in the region. Centred around the eponymous site of Mapungubwe at the confluence of the Shashe and Limpopo Rivers, the emergence of an elite who held sway over social, economic and ritual life has led to a traditional, top-down hierarchical understanding of political organisation. Furthermore, the rapid abandonment of the site at the end of the thirteenth century has been held up as a classic example of total societal collapse that ripped through a hinterland of c30,000sqkm. Recent research however, has re-directed attention to these so-called hinterlands, and critiqued the implicit idea that they were passive political actants. Specifically, in previous research we have employed the triptych of territorialisation-deterritorialisation-reterritorialisation to explore the enmeshed relations between different nodal points in the political landscape, refuting the concept of an apical centre. In this paper we extend these ideas to examine regional and local patterns of 'collapse' from a hinterland perspective. Drawing on recent research to the east and to the south of Mapungubwe, we will examine how local trajectories emerge at the thirteenth century transition, and how 'collapse' can be reframed as resilience at a micro-scale.

07 WHY DID ONE COLLAPSE AND THE OTHER NOT? COMPARING TECHNOLOGIES IN TURBULENT IRON AGE PHASES IN SOUTHERN AFRICA AND SCANDINAVIA

Author(s): Fredriksen, Per Ditlef (Department of Archaeology, Conservation and History, University of Oslo; Department of Archaeology, University of Cape Town)

Presentation Format: Oral

This paper presents a comparison of social dynamics in two Iron Age segments characterized by complexity and turbulence: one in southern Africa from the mid-17th to the mid-19th century AD and the other in Scandinavia from the mid-4th to the mid-6th century AD. The two cases, broadly similar in duration (about 200 years) share two interesting sets of traits and factors, which are recognizable to archaeologists worldwide working with pre- or proto-historic complex societal formations. The first is an accelerated development of technologies (e.g. ceramics and metalworking), leading to discussion of the extent of specialised production. Secondly, this change of pace occurs in tandem with significant changes to architecture, settlement spaces and the organisation of households. These processes may be seen in connections with expanding networks of trade and other means of contact. Both cases comprise a terminal phase of an Iron Age sequence, with political turbulence, the collapse or reconfiguration of social institutions and relocation of people, while the ceramic and metal technologies show evidence of synergetic experimentation and innovation. However, the cases differ in one important respect: while one ceramic knowledge tradition collapsed and disappeared, the other did not. Why was this so? Seeking to provide answers, I present recently conducted pilot studies of both cases. Sensitive to stress indicators and factors that contribute to the vulnerability as well as to the long-term resilience of craft traditions, a core argument in my comparative approach is the need to work from a cross-craft perspective. Focusing on the social dynamics of craftspeople and the potential for intimacies between crafts, it cannot be overlooked that activities such as metalworking and pottery manufacture were anchored in the household as a social institution. That is, they shared the most important social and spatial arena for transmission of sophisticated craft knowledge.

154 MANIPULATED BODIES: CASE STUDIES OF POST-MORTEM INTERACTIONS WITH HUMAN REMAINS

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Craig-Atkins, Elizabeth (University of Sheffield) - Ion, Alexandra (Institute of Anthropology Francisc I. Rainer of the Romanian Academy) - Eriksen, Marianne Hem (University of Oslo; University of Cambridge)

Format: Regular session

Following death, the human body becomes the focus of a diverse range of activities conducted by the living. While burial in an earthen grave in a location designated for the disposal of the dead has been normative practice throughout the past in many locations across Europe, there are also a multitude of other ways in which the dead have been, and continue to be, managed. These include non-burial forms of funerary treatment, intentional exhumations, the responses to unintentional disturbances and forms of collection and curation of human remains. From bones in ossuaries and human remains in museum collections to puzzling body parts discovered beneath prehistoric houses, people have been curating others throughout the centuries. What can we learn from such post-mortem biographies, and what are the challenges faced by archaeologists and curators? This session aims to highlight potential comparative perspectives across social, cultural and temporal contexts, thereby examining the reasons why, contexts within and means by which the material body is manipulated after death.

This session seeks to draw together applied research and cases studies that examine post-mortem interactions with the dead and the archaeological body. It will run alongside the more theoretically inclined "Boundary bodies: Critically thinking the body in contemporary (osteo)archaeology".

ABSTRACTS

01 SYMBOLIC REPLACEMENT OF SEVERED BODY PARTS WITH OBJECTS IN 3RD-7TH CENTURY AD GRAVES IN ENGLAND

Author(s): Mays, Simon - Crosby, Vicky (Historic England)

Presentation Format: Oral

Normative inhumation in 3rd – 7th century Britain was extended supine burial, but deviant burials are sometimes found. Deviations include decapitation or other bodily mutilations. Occasionally, the severed head or other missing body part is replaced in the grave an object placed at the appropriate anatomical location. This paper reviews this practice and describes some new examples from a cemetery at Stanwick, England. The 3rd – 5th century AD Stanwick cemetery contains 35 inhumations; five were decapitated. In two instances, the severed head was placed in the lower part of the grave and a large stone lay atop the vertebral column in place of the head. Another inhumation was found buried prone with a large flat stone wedged in its mouth. In this last case, analogy with other instances where severed body parts are replaced with stones or other objects suggests that the stone was a symbolic replacement for a severed body part, in this case the tongue. This interpretation is supported by osteological study: the mandible shows

alterations that may be consistent with amputation of the tongue in life. A number of causes of tongue ablation are possible. One is judicial mutilation. The medical literature suggests further possibilities: although assault or accident are sometimes responsible, more frequently such injuries are self-inflicted in patients suffering seizures or mental illness. These possibilities are discussed for the Stanwick burial, and the discussion is framed within the broader context of the evidence for bodily mutilation in Roman and Dark Age Britain.

02 A MULTI-DISCIPLINARY APPROACH TO IDENTIFYING DELAYED BURIALS AT NEOLITHIC ÇATALHÖYÜK, TURKEY: INITIAL RESULTS

Author(s): Haddow, Scott (Koç University Research Center for Anatolian Civilizations) - Schotsmans, Eline (PACEA, University of Bordeaux) - Milella, Marco (Universität Zürich-Irchel) - Pilloud, Marin (University of Nevada, Reno) - Knüsel, Christopher (PACEA, University of Bordeaux)

Presentation Format: Oral

Recent observations at Neolithic Çatalhöyük provide increasing evidence for a period of delay between the death and burial of certain individuals, wherein the bodies of some members of the community were retained as part of an extended, multi-stage funerary sequence, possibly seasonal in nature, or perhaps much longer. The evidence for protracted liminal funerary practices derives primarily from variations observed in the articulation and preservation of skeletal elements, as well as the degree of flexion observed among skeletons found in primary burials. Some individuals are fully articulated, while others are missing certain skeletal elements or show signs of paradoxical disarticulation of joints. The extent of flexion observed in some skeletons might suggest a substantial loss of soft tissue body mass prior to interment. Furthermore, the large number of isolated crania and skulls recovered from a variety of depositional contexts clearly demonstrates that they cannot have been retrieved from primary burials alone, as there have been far fewer "headless" primary burials excavated. Based on these observations, it appears that some bodies were treated in such a way as to reduce or remove soft tissue mass, while attempting to maintain the anatomical integrity of the body. The manner in which this processing took place is not clear, but hypotheses include defleshing of the corpse with stone tools, desiccation, and exposure of bodies to vulture scavenging. Here, we present the initial results of the various approaches taken to this question, including bone histotaphonomy, soil chemistry, as well as alterations of bone by human and non-human agents.

03 'THE SCULLS THAT LIE HEAP'D UP': POST-MORTEM INTERACTIONS WITH HUMAN REMAINS IN THE CHARNEL HOUSE AT ROTHWELL (NORTHAMPTONSHIRE, UK)

Author(s): Craig-Atkins, Elizabeth - Crangle, Jennifer (University of Sheffield) - Barnwell, Paul (Oxford University) - Hadley, Dawn (University of York)

Presentation Format: Oral

Curation of human remains in English charnel houses has received limited attention in studies of funerary practice, and comparatively less interest than charnel practices elsewhere in Europe. Yet analysis of architectural, archaeological and documentary evidence, including antiquarian accounts, suggest charnelling in England was more widespread than has hitherto been appreciated. The unique survival of a medieval charnel house and its contents at Rothwell, Northamptonshire has enabled the first comprehensive, multi-disciplinary study of a well-preserved chapel where human remains survive in situ. New architectural, geophysical, topographic and osteological analysis, alongside radiocarbon dating of the human remains, permit a novel contextualisation of a charnel house in its medieval theological and liturgical context. It also enables an exploration of the post-medieval rediscovery of the crypt, the reimagining of the charnel over time and interactions with the bones over the last three hundred years, including the addition of human remains and its development as a tourist attraction. We argue that the charnel house at Rothwell, a subterranean room constructed during the thirteenth century, may have been a particularly sophisticated example of an experiment born out of beliefs surrounding Purgatory and reveal a range of different practices with varied motivations that have continued to manage the dead at this site since its rediscovery at the beginning of the 18th century.

04 ETERNAL REST? CEMETERY TRANSFORMATIONS AND A NEW OSSUARY PROJECT AS COMMUNITY-PROJECT IN STEINSEL/LUXEMBOURG

Author(s): Kolnberger, Thomas (University of Luxembourg)

Presentation Format: Oral

In Christian tradition, the re-use of grave plots implies the exhumation of bodily remains, which, at the same time, raises the question of a decent re-burial. For centuries, ossuaries were used as final depository for the bones of the dead. In Luxembourg, the last of these 'charnel houses' was built at the end of the 17th century. The consecutive Ages of Reason, Revolutions and Modernization (1600-1900) led to the stepwise closure of the ossuaries. Modern Times also witnessed the transformation of the old churchyard into the contemporary cemeteries. Human remains, however, remained – and persisted as 'recalcitrant objects'. In Luxembourg and elsewhere in NW-Europe, modern cemetery regulations stayed surprisingly silent in dealing with excavated corpses of the deceased. The problem how to proceed with exhumed 'leftovers' was left up to the municipalities.

In Steinsel, the re-introduction of an ancient/traditional final disposal for human remains is supposed to solve the same challenges as in the past: to create new burial space in an 'overcrowded' cemetery at one hand. On the other hand, this building should serve as a new-style memento mori for the municipality. In our presentation, we will focus on the ongoing community project with the partici-

pation of the citizens; the socio-historical background; the challenges of the building task and the integration of this revived building type into the deathscape-concept of Steinsel's main cemetery (between functional, recreational and space of commemoration) as 'reflecting futures'.

05 UPPER PALEOLITHIC MORTUARY PRACTICES AND BODY PART MANIPULATIONS: NEW INSIGHTS FROM CUSSAC CAVE (DORDOGNE, FRANCE)

Author(s): Kacki, Sacha (Department of Archaeology, Durham University; PACEA, Université de Bordeaux) - Trinkaus, Erik (Department of Anthropology, Washington University in Saint Louis) - Schotsmans, Eline - Guyomarc'h, Pierre - Villotte, Sébastien (PACEA, Université de Bordeaux, France)

Presentation Format: Oral

Cussac cave (France) hosts a unique combination of parietal art (150+ engravings) and several hundred parts of scattered human remains, dating to the Gravettian (31,000–22,000 BP). The cave is protected as National Heritage, so that only non-invasive bioanthropological analyses are allowed, consisting of in situ observations and measurements, completed with virtual models.

Human remains were identified in three different loci. One of them (locus 2) consists of a bear nest containing a well-represented skeleton. The adult male (<50 years old) had been placed on ventral decubitus, without colorants or grave goods. He displays an unusually short stature, relatively long femora, and an unusual cranial morphology.

At the two other loci, commingled bones of at least 4 other individuals (3 adults and one adolescent) are present in bear nests. At locus 1 the bones are highly fragmented whereas at locus 3 most of the skeletal remains are intact. Displacements of body parts from one locus to another, as well as inside each locus, are suspected. Ochre is observed at both loci, on the surface or the bones. Mandibular fragments are present but the crania are missing.

Based on these observations, it seems clear that unknown Gravettian mortuary practices took place at Cussac. Bodies or body elements of at least five individuals were placed in bear nests and ochre was applied. It is assumed that some body parts (with or without soft tissue) were then moved within each locus and possibly between two loci. It is unclear when the crania of four of these individuals were removed or if they had ever been present in the cavity after deposition. This study adds to the variability in mortuary practices in the Upper Paleolithic, as is also inferred for Abri Pataud (France), Pavlov I (Czech Rep.) and Sunghir (Russia).

06 PATTERN, PROCESS, AND PROCESSING: POST-MORTEM INTERACTIONS WITH THE DEAD IN LATE PREHISTORIC EUROPE

Author(s): Beck, Jess (McDonald Institute for Archaeological Research) - Quinn, Colin (Hamilton College) - Ciugudean, Horia (Muzeul National al Unirii din Alba Iulia)

Presentation Format: Oral

In contrast to later periods that show a more strictly circumscribed approach to the location and treatment of skeletal remains, third millennium Europe was host to a wide variety of human interactions with dead bodies. This variability is particularly noteworthy in Iberia, where over the course of the Copper Age human bones were subject to a wide range of funerary rituals, including interment in commingled deposits in natural and artificial caves and rock shelters, burial in primary and secondary depositions in purpose-built mortuary features, and scattering as fragments in enclosure ditches and other architectural features. Here, I focus on a series of illustrative cases from large-scale Chalcolithic sites in Spain and Portugal to illustrate intra-site variability in mortuary treatment, and to consider what such variability meant for the social and ritual organization of these prehistoric communities. Next, I move to the mountains of southwestern Transylvania, where distinct mortuary tracks are recorded for upland sites in the Apuseni highlands and lowland sites in the Mureş River valley. Here, I describe how my initial bioarchaeological analyses of Early Bronze Age mortuary populations have important implications for understanding the negotiation of community identities and territorial relationships. Overall, evidence from both Iberia and Romania points to the dead being a constant presence in Late Prehistoric societies, with continuous interaction with the human remains, physically and perhaps even socially, an important component of daily life.

07 A MULTI-METHOD APPROACH TO COLLECTIVE BURIALS FROM LATE NEOLITHIC MALTA: THE CASE OF THE XAGHRA HYPOGEUM, GOZO

Author(s): Parkinson, Eóin - Thompson, Jess (University of Cambridge) - McLaughlin, Rowan (Queen's University Belfast) - Stoddart, Simon (University of Cambridge) - Malone, Caroline (Queen's University Belfast)

Presentation Format: Oral

Collective burials uniquely preserve direct evidence of long-term engagement with the remains of the dead, making them valuable records of past human activity. Over the past few decades, a significant amount of research has been undertaken on Neolithic collective burial sites, interpreting depositional processes and practices through the related methods of archaeoethnology and taphonomy. Combining taphonomic analysis of human remains with the application of Geographic Information Systems (GIS), this paper investigates the parallel processes behind the re-distribution of human remains and structural remodelling within the Xaghra hypogeum, Gozo. The Xaghra hypogeum (2900–2350 BC) is a large mortuary complex containing the remains of at least 900 individuals. Located within a natural cave system, the hypogeum was elaborated with megalithic architecture and periodically restructured. In addition to these restructuring events, human remains were deliberately dispersed around the hypogeum as part of a complex set

of secondary funerary rites. The results of the combined GIS analysis of burial deposits and artefacts has identified route-ways and structural remodelling events within the hypogeum, providing insights into how space was constructed, navigated and perceived in late Neolithic Malta. Taphonomic analysis of human remains from archaeological contexts implicated in these events has shown that there were multiple pathways for interacting with the dead, all traditionally defined as forms of secondary burial. Contextual detail, however, suggests that the meaning of various forms of secondary burial may have differed. Aligning these approaches therefore has broader implications for how we model funerary practices and understand past geographical and spatial knowledge. We argue that a multi-method approach to collective burials can facilitate a greater understanding of post-mortem pathways of the dead.

08 PARALLEL LINES: TRIANGULATING MULTIPLE LINES OF EVIDENCE FOR CURATION OF THE DEAD IN NEOLITHIC BRITAIN

Author(s): Smith, Martin - Delbarre, Gabrielle (Bournemouth University) - Endicott, Phillip (Musée de l'homme, Paris) - Whittington, Andrew - Darvill, Timothy (Bournemouth University)

Presentation Format: Oral

Over the last decade a succession of game-changing discoveries has led to a growing suspicion that accepted views of much of the funerary record of prehistoric Britain may in fact be wrong. New techniques and a more holistic approach to interpretation have revealed complex mortuary treatments involving the protracted curation of the remains of the dead in states where varying degrees of soft tissue preservation appear to have been achieved. Key examples from various periods raise the question of just how many previously excavated prehistoric burials, for which relatively simplistic mortuary treatments have been assumed, should now be reassessed. The current paper presents a newly excavated example of human remains recovered from a burial monument in central England. Sisters Long Barrow is the first Severn Cotswold monument to be discovered and excavated this century, offering unparalleled opportunities for analysis of its contents applying a panoply of modern techniques.

Investigation of blocking deposits in the monument's forecourt revealed a secondary cist containing the remains of four individuals of varying ages. Consideration of these remains from taphonomic, microscopic, archaeoanatomical, histological and genetic perspectives has provided a detailed picture of a drawn-out series of treatments which complement indications from elsewhere in southern Britain that rudimentary forms of mummification were being practised at least as far back as the early Neolithic. This observation raises further questions as to how communities continued to interact with the deceased in societies where the dead were neither gone nor forgotten.

09 BODY MANIPULATIONS AND GRAVES RE-OPENING IN THE ENEOLITHIC CEMETERIES FROM SOUTHEASTERN EUROPE. A CASE STUDY FROM ROMANIA

Author(s): Lazar-Radus, Catalin Alexandru (Department of Ancient History, Archaeology and Art History, Faculty of History, University of Bucharest; Department of Archaeology, National History Museum of Romania) - Craciunescu, Ionela (C.N.A.I.R., Bucharest) - Opris, Vasile - Ignat, Theodor (Bucharest Municipality Museum)

Presentation Format: Oral

The current paper will present an overview of the Eneolithic cemeteries from Southeastern Europe from the perspective of body manipulation and graves re-opening by the living. A particular focus will be given to the Eneolithic cemetery of Sultana-Malu Roşu in Romania (ca. 5000-4000 cal. BC) where some cases that can be included in the approached topic are documented. This cemetery comprises 99 inhumation graves investigated until now, most of them being regular graves (single primary burials). The secondary burials and skeletons without skulls represent an unusual situation in this cemetery. They demonstrated a complicated process of manipulation of the human body in this community and the unique perspective of the living members of society about the funerary ritual and the death of the individuals. Also, this kind of burials may reflect shared identities between the living and the dead, mainly because some human anatomical elements were found scattered in the area of the settlement who use this cemetery.

Our analysis will be a focus on the study of this deviant burials in relation to regular funerary rituals attested in this cemetery, correlated with palaeodemographic data and their spatial location in the mortuary area (GIS analysis). Also, we will explore the aspects regarding the individual, shared, and collective identities created by the living in this cemetery, in connection with similar finds from Balkan Eneolithic.

This work was supported by a grant of the Romanian Ministry of Research and Innovation, CCCDI - UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0686, within PNCDI III.

10 INTERACTING WITH THE DEAD. BELIEF AND CONFLICT IN EARLY MEDIEVAL EUROPE (AD 450-750)

Author(s): Klevnäs, Alison - Noterman, Astrid (Stockholm University) - Aspöck, Edeltraud (Austrian Academy of Sciences) - Haperen, Martine (Leiden University) - Zintl, Stephanie (Bayerisches Landesamt für Denkmalpflege)

Presentation Format: Oral

This paper will introduce a new project starting at Stockholm University in autumn 2018, building on the previous work of members of the Grave Reopening Research network (reopenedgraves.eu).

The project will study customs of revisiting, reworking, and retrieving human and material remains which have newly been recognised in burial grounds across early medieval Europe, using them as an innovative route into understanding beliefs and community life in

this formative period of social and religious change.

Once into the Christian Middle Ages, burial sites became places of worship and pilgrimage, with human body parts revered as relics. But the traditional view of the earlier pagan societies is that the dead were kept separate from the living, lying undisturbed in rows of graves in quiet fields, surrounded by their treasured possessions and grave gifts.

This research will show that far from decomposing in peace, the pre-Christian dead were regularly and frequently unearthed. Over 3 years, it will bring together the first Europe-wide survey of grave reopening practices, showing that a set of related customs can be seen at hundreds of excavated sites over a geographic range from Transylvania to central Spain to southern England.

Applying forensic and archaeoanatomical techniques to the excavated evidence, the researchers will reconstruct the reopening practices in detail, exploring their methods and motives as a source for past understandings of such fundamental concepts as death, the body, and ownership. Tracing the spatial and chronological development of the customs, the project will ask how their recognition changes our picture of the societies of the period.

11 POST-MORTEM BIOGRAPHIES OF THE DECEASED UNDER THE FLOORS OF FINNISH CHURCHES

Author(s): Kallio-Seppä, Titta - Väre, Tiina - Lipkin, Sanna - Tranberg, Annemari - Ylimaunu, Timo (University of Oulu)

Presentation Format: Oral

Burying deceased under church floors was common in Finland from the medieval times until the early 19th century, when the burial tradition was prohibited in 1822 by an imperial order. At first only the important members of the society received the final resting place under church's roof. During the 18th century, the tradition had become more common which led to crowded spaces under floors. Many of the individuals have mummified shortly after their burial.

In this paper we explore what kind of changing meanings the deceased have had for their relatives, members of the community, and scientists during the past centuries. At first the deceased were mourned by their families, which can be seen especially from the CT-scanned coffins of children. The church goers were also constantly reminded for the presence of the bodies through unpleasant odors. During the later centuries, the deceased became targets of curiosity and subjects of ghost stories written in newspapers. The most famous individual is a 17th-century mummified vicar Nikolaus Rungius from Kemi parish. During the centuries, even though he was already the seventh Lutheran vicar of the parish, his mummy became an important attraction – even an unofficial relic, perhaps comparable to the Catholic incorruptible saints. Exhibiting his mummified remains to the public has turned his private corpse into public property. In this paper we will consider Rungius' and other mummies' stories, and their meaning for different generations.

12 HUMAN BONE RELICS FROM ESSEN CATHEDRAL, GERMANY: OSTEOARCHAEOLOGICAL INSIGHTS INTO THE CONVOLUTED JOURNEY OF HOLY OBJECTS WHICH LOST THEIR CONTEXT

Author(s): Meyer, Christian (OsteoARC) - Hopp, Detlef (Stadtarchäologie Essen) - Wegener, Andrea (Domschatzkammer Essen) - Jung, Patrick (Ruhr Museum Essen)

Presentation Format: Oral

In 2009 during construction work near the Cathedral of Essen 54 bone fragments were discovered in the ground, of which 37 (69%) could securely be identified as osseous relics due to obvious anthropogenic modifications. The remaining bones might include stray finds from the cemetery surrounding the cathedral. The obvious relics were wrapped in textiles and were partly labelled with numbers and letters.

The subsequent osteoarchaeological analysis revealed an MNI of at least 6 individuals. Of the secure relics 30 (86%) are from adults, 4 (11%) from subadults. Five adult specimens could be determined as likely male, nine as likely female. In addition, two animal bones (4%) could be identified which were also wrapped and labelled and were apparently considered relics as well. All the bones display typical soil staining and ancient damage consistent with prior long-term inhumation. As some of the textiles, likely dated to the 17th / 18th century AD, wrap closely around dry bone fracture edges it is highly likely that these relics were exhumed from their original burial places several centuries ago and were later modified as described. They were likely also displayed as intricate arrangements at a time as indicated by remains of glue, which combined bones from different individuals.

Further research led to the conclusion that the relics lost their ascribed context at some point in the past and were stored away, not longer used in active religious practice. Later they were reburied in (former) sacred ground next to the cathedral, where they were accidentally recovered as archaeological finds just a few years later. Thus they acquired an altogether new context, after their journey from life to primary burial, exhumation, modification, veneration, decontextualization and reburial. The presentation will try to reconstruct the convoluted path of these bone relics back in time as far as possible.

13 SOME ASPECTS OF INTERPRETATION OF COURONIAN CREMATION BURIALS DURING 10-15TH CENTURIES

Author(s): Tomsons, Arturs (Latvian National History museum)

Presentation Format: Oral

During year 1198 a crusade against peoples of East Baltic started. After almost a century of a struggle, Confederation of Livonia was founded. Medieval state founded by German and Danish crusaders and clergymen replaced pagan chiefdoms in the territory of

modern Latvia and Estonia.

Couronians – the biggest of the West Balt peoples living in Courland (Kurzeme) peninsula were forced to surrender after their last uprising after year of 1260. However, they surrendered with treaties and mostly kept many aspects of their previous pagan traditions and beliefs until almost 15-16th centuries.

One of the most significant expressions of these customs was use of cremation burials despite formal Christianisation. Evidence of deliberate destruction of grave goods as well as reflections of several stages of a complex burial ritual is visible in the archaeological record (burnt and unburnt grave goods, moving of the cremation remains after cremation etc.).

Several cemeteries have been investigated providing researchers with rich archaeological sources – both cremated human remains as well as rich and often damaged grave goods.

Couple of cremation experiments were undertaken by the author which allowed better interpreting actual archaeological finds and comparing them with several later written sources allow us to identify stages of burial customs and understanding the complex West Balt burial rites in general.

14 MANIPULATING BODIES IN PREHISTORIC TO PROTO-HISTORIC CYPRUS: FROM THE EARLIEST NEOLITHIC TO THE LATE BRONZE AGE

Author(s): Lorentz, Kirsi (The Cyprus Institute)

Presentation Format: Oral

The ways in which human bodies were disposed of in prehistoric to proto-historic Cyprus range from simple earth cut pit burials to elaborate manipulations of skeletal elements, or even fleshed body parts, showing extensive anatomical knowledge. This paper focuses on how bioarchaeology can go beyond exploring questions of biology and anatomical variation, addressing key issues of context, and key topics in social sciences (the body). In specific, the revolutionary changes effected on understandings of Chalcolithic mortuary practices in Cyprus by the first ever detailed positional analyses of human skeletal remains conducted on the island are explored. The development and execution of detailed recording, recovery, and analytical methodologies resulted in the discovery of previously unknown and complex manipulations of human bodies and remains, as well as in the discovery of highly complex anatomical knowledge in the past. These results will be put into context through comparison with the current understandings of body manipulations ranging from the earliest Neolithic in Cyprus, including the Kissonerga Mylouthkia water wells, to later data from Bronze Age contexts, such as the manipulations evident at the Kalavassos Ayios Dhimitrios Tomb 11, of Late Bronze Age date. Such data throws light on the levels of detailed anatomical knowledge in the past.

a. WOMEN AND MOTHERS: THE SINGULAR TESTIMONY OF T310 BURIAL; NECROPOLIS OF MONTE SIRAI (CARBONIA- SARDINIA, ITALY).

Author(s): Piga, Giampaolo (Laboratory of Forensic Anthropology, Centre for Functional Ecology, University of Sassari) - Pla Orquín, Rosana (Department of History, Human Sciences and Education, University of Sassari) - Gonçalves, David (Archaeosciences Laboratory, Directorate General for Cultural Heritage - LARC/CIBIO/InBIO; Research Centre for Anthropology and Health - CIAS, Department of Life Sciences, University of Coimbra; Laboratory of Forensic Anthropology, Centre for Functional Ecology, Department of Life Sciences, University of Coimbra) - Pimenta, Carlos (Archaeosciences Laboratory, Directorate General for Cultural Heritage - LARC/CIBIO/InBIO) - Guirguis, Michele (Department of History, Human Sciences and Education, University of Sassari)

Presentation Format: Poster

We present a case of a burial (called: T310) from the Phoenician Punic necropolis of Monte Sirai (Carbonia, Sardinia, Italy). The burial of the T310, concerning the inhumation of an adult woman inside a tomb with unique constructive characteristics, is very peculiar. Above the tibias, a large pot with two handles was laid upside down for the final closure of the tomb. The container showed signs of blackening both on the outer and inner surfaces. The microexcavation of the pot contents has led to the recognition of bone fragments related to at least three birds (identified belonging to the Turdidae family) mixed with a semi-combusted perinatal infant. It seems evident that the documented ritual has very close analogies with the practices of deposition of infants inside particular sanctuaries called tofet. The T310, due to its dating, testifies to the early adoption of a funeral practice with precise symbolic connotations in a moment prior to the structuring of the tofet, which occurred at the Monte Sirai necropolis during or after the second quarter of IVth century BC.

Previously to the development of the sanctuary dedicated to the deposition of the infants deceased of the Punic community, this singular ritual already anticipated some of the primary features of the characteristic sanctuaries of children in the Occident. Both the use of similar pots and the coexistence of human and animal bones finds direct parallel in the documentation collected in the Monte Sirai tofet.

b. BONES IN THE BASEMENT. THE STUDY OF THE REMAINS OF THE 19TH-20TH CENTURY ST. ANNA-CEMETERY IN KOEKELBERG, BRUSSELS, BELGIUM

Author(s): Van de Vijver, Katrien (Royal Belgian Institute of Natural Sciences) - Claes, Britt - Ghesquière, Valérie - Hardenne, Louise (Royal Museums of Art and History)

Presentation Format: Poster

Recent excavations on the site of the former cemetery of the St. Annachurch in Koekelberg, Brussels, in use between 1833 and 1916, resulted in a large collection of human remains. Historical studies indicate the graves were transferred to a new cemetery between 1916 and 1931. The excavation nevertheless revealed nine articulated depositions and over 8000 litres of disarticulated bones in the cellar of the sacristy. The demolition of the church and the construction of houses in 1985 may have disturbed graves, whose contents were dumped on-site. The MNI indicates hundreds of individuals, mostly adults. Although the disarticulation hindered the osteological study, it was possible to derive information for taphonomic, demographic and palaeopathological studies.

The degree of preservation and presence of other materials offered indications for post-depositional treatment. Organic materials were found on several bones, possibly soft tissues besides remains of hair, wood and textile. Many bones were partly covered with white powder, indicating the presence of lime. The organic materials suggests bodies were not fully decomposed when they were disturbed and lime may have been added as a disinfectant, to counter the smell or speed up decomposition.

Despite references to the transferral of the graves and their recent date, many burials were left in place. It is unclear how many were moved and there may have been a selection, e.g. based on the presence and/or actions of relatives. The later disturbance of graves indicates their presence was unknown and the choice was made to dump them in the cellar of the sacristy, rather than move them to the new cemetery or allow archaeological study. Despite the recent date, this site offers indications for attitudes to the dead and responses to the unexpected discovery of human bones, revealing different approaches, even to human remains from the recent past.

c. PARTS OF A NEW WHOLE: FIRST STEPS TOWARDS A BIOARCHAEOLOGICAL INVESTIGATION OF LATE CYPRIOT ATTITUDES TOWARDS DEATH AND THE BODY

Author(s): Lee, Hannah (University of Sheffield) - Nikita, Efthymia - Christofi, Polina (The Cyprus Institute)

Presentation Format: Poster

This contribution explores whether analysis of multi-faceted and practised identities can be achieved using a biosocial approach, focusing on the analysis of commingled human remains from Late Bronze Age Cyprus. The skeletal sample, deriving from a single, unpublished chamber tomb from the Ekali area of Limassol, is analysed using a taphonomy-oriented methodology, integrating 'traditional' analytical tools such as Bone Representation Indices (BRIs) with archaeoanthatological principles. This will help identify possible post-mortem disturbances of the remains, and hopefully distinguish whether these were natural or anthropogenic in character. These approaches are combined with the systematic macroscopic study of the remains, focusing on osteobiographic aspects such as demographic attributes, kinship, pathological and activity markers. The osteological data is mapped onto theoretical approaches regarding the constitution of identity through burial practice, considered against the backdrop of social change in Late Bronze Age Cyprus and taking a diachronic approach focusing on the period of this tomb's use. This project fills two key lacunae in Cypriot bioarchaeology. Firstly, it demonstrates the utility of robust taphonomic methodology in interpreting a fragmentary, commingled sample obtained through salvage excavation. Second, the multidisciplinary nature of this project fills an identified need in Cypriot bioarchaeology for studies taking an integrated osteoarchaeological and theoretical approach.

170 AGE EAA SESSION ON "GENDER AND COLONIALISM"

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Monton-Subias, Sandra (ICREA/UPF) - Marin-Aguilera, Beatriz (University of Cambridge) - Papoli-Yazdi, Leila (Freie Universität Berlin)

Format: Regular session

This session aims to discuss the effects that different types of colonial domination had on different local sex/gender systems. Colonialism brought into co-existence groups of people with different sex/gender systems in the framework of asymmetrical relations of power. It thus frequently altered and/or disrupted natives' gender understandings that were incompatible with those brought and imposed by colonial powers.

Focus will be on the role that material culture and the body played in these colonial processes in relation to gender. We will welcome contributions that reflect on how gender transformations were performed and implemented on the ground, and what they entailed for the people who experienced them. Topics include (but are not limited to) the re-structuration of living spaces, children's socialization, food systems, dress, kinship, healing practices, belief systems and sexuality.

01 GENDER AND COLONIALISM. AN INTRODUCTION TO THE 020 01 08 AGE SESSION

Author(s): Papoli Yazdi, Leila (Freie Universität Berlin) - Monton-Subias, Sandra (ICREA; Universitat Pompeu Fabra) - Marín Aguilera, Beatriz (University of Cambridge)

Presentation Format: Oral

In this paper, the co-Organisers of the 2018 EAA AGE Session will explain why this year AGE has selected the topic of Gender and Colonialism to be explored at the 2018 EAA Annual Meeting in Barcelona. In addition, they will present the AGE (Archaeology and Gender in Europe) to those assistants to the session that are not familiarized with it.

As one of its main goals, the AGE community seeks to create a meeting place and a discussion platform for scholars interested in gender and feminist studies in archaeology and related disciplines. This year, we will discuss the effects that different processes of colonial domination had on different local sex/gender systems. In congruence with previous AGE sessions, we will cross spatial and temporal boundaries to reunite scholars that investigate how gender transformations were performed and implemented on the ground in areas both culturally and geographically distant. Our contributions encompass situations that range from the impact that New Kingdom Egypt had on Nubia and the Spanish Empire had on different areas of the Atlantic and the Pacific, to diaporic or colonial contexts in the ancient Mediterranean such as the Balearic Islands and northeast Catalonia. Issues related to coloniality of knowledge and how they affect our interpretation of the past will be also covered.

02 GENDER RELATIONS IN COLONIAL PERIPHERIES: THE POSTALAYOTIC SOCIETY AS A CASE STUDY (S.VI-II A.C./BALEARIC ISLANDS, SPAIN)

Author(s): Torres Gomariz, Octavio (University of Alicante)

Presentation Format: Oral

The role played by the Punic colonial power in shaping Postalayotic society is still controversial. Since the arrival of the Phoenicians in Ibiza, the contacts between the communities that inhabited the neighboring islands have had a variable character, oscillating between an apparent isolation or resistance in the first place, to a later immersion in the commercial area directed from the Punic city of Ybshm/Ebusus. In any case, towards the middle of the 6th century a.C., an important social fracture is detected in which undoubtedly the Punic colonial interests were an accelerator. Within the framework of these profound socio-economic changes that took place in Mallorca and Menorca, encompassed by the Postalayotic period (550-123 BC), the structure of society was also affected at its foundations: domestic groups and their relationships, especially in terms of gender.

The domestic and funerary materiality, supported by some written testimonies available in classical sources, are the basis for understanding the gender and their interrelations in the Balearic postalayotic. The transcendental role played by women in the organization and structure of the group, as well as in its socialization, especially in childhood, will be observed. Men, on the other hand, will consolidate as fundamental pieces in the bosom of incipient patriarchal groups. To this panorama will be added the direct consequences of the Punic colonial contact, which will bring the arrival of foreign population to the islands and also the systematic exit of a segment of the community to integrate the Punic army. Likewise, the gender relations established in the Punic orbit will be decisive in order to end up strengthening the changes initiated in these island societies and his daily life.

03 “HE IS LOOKING AT BOWMEN LIKE WOMEN”: ANCIENT EGYPTIAN GENDERING OF NUBIANS DURING THE NEW KINGDOM

Author(s): MATIC, UROS (Westfälische Wilhelms-Universität Münster)

Presentation Format: Oral

During the New Kingdom (c. 1550 – 1077 BC) Egypt has established state control over Nubia (modern south Egypt and north Sudan) through military campaigns against the kingdom of Kush, with its capital in Kerma, and other local polities in the region. Although being in contact with the region since the fourth millennium BC, after the control over it has been established in the New Kingdom, Egyptians become increasingly present in Nubia and Nubians become more prominent in Egyptian iconography. This paper will examine New Kingdom Egyptian textual and iconographic sources on Nubians from gender perspective. Through analysis of reliefs and inscriptions from temples and private tombs together with small finds with depictions of Nubians it will be argued that New Kingdom Egyptian ideology gendered Nubian men and boys as women-like and cowardly and Nubian women as hyper-sexual. Drawing on “decolonial feminism” of María Lugones (2007, 2011) the paper will explore how this ascribed constructed gender binary not only served Egyptian imperial ideology in constructing the enemy Other, but also at the same time normativised Egyptian binary gender system. Finally, the paper will consider the possibilities of exploring how Egyptian gender discourse influenced the lives of inhabitants of Nubia under the Egyptian rule.

04 GENDER AND MAINTENANCE ACTIVITIES IN THE FIRST GLOBALIZATION. THE EXAMPLE OF COLONIAL GUAM (1668-1700)

Author(s): Monton-Subias, Sandra (ICREA/UPF)

Presentation Format: Oral

Colonial domination brought into co-existence groups of people with different sex/gender systems. It frequently disrupted local gender understandings incompatible with those imposed by colonial agents. In this paper, I will present one of such situations: the incorporation of Guam by the colonial network of the Spanish empire.

Understood as a “civilizing” (sensu Fanon 1952) enterprise by Jesuit missionaries, the colonization of Guam targeted from the outset gender arrangements and Maintenance Activities, a concept used in archaeology to highlight the foregrounding nature of a set of daily practices that are essential to social continuity. From the re-structuration of living spaces to children’s socialization, through food, dress, kinship, healing practices and sexuality, Jesuit missionaries aimed to dismantle native Chamorro lifeways, which were mainly organized through Maintenance Activities.

In this paper, I would like to focus on the first years of colonization, on the period known as the Spanish-Chamorro wars (roughly 1668-1700). These were the years that witnessed more conflict and dramatic changes for the Chamorro communities. My aim is to discuss the interrelationship between colonial processes, material culture and the construction of gender. Through the interpretation of Guam’s specific case, I would like to show the day-to-day of more general gender-global changes.

05 LUCIA MIRANDA AND THE STAYS. DIFFERENT STRATEGIES FOR FEMALE GENDER SUBMISSION IN COLONIAL CONTEXTS

Author(s): Escribano-Ruiz, Sergio (University of the Basque Country - UPV/EHU; Grupo de Investigación en Patrimonio Contruido - GPAC) - Azkarate, Agustín (University of the Basque Country - UPV/EHU; Grupo de Investigación en Patrimonio Contruido - GPAC; UNESCO Chair on Cultural Landscape and Heritage)

Presentation Format: Oral

During the advent of colonialism that followed the 16th century European social rules were imposed to the conquered societies. When applied to the colonies, these rules were based on an explicit notion of white supremacy, but also bring with them implicit strategies for the domination of the feminine gender. On some occasions, these strategies implied turning women into scapegoats. It happened in the case of Sancti Spiritus (Argentina), where a love story between the native chiefs and a white woman named Lucia Miranda was considered the cause of burning the Spanish fort. As it seems to be a later reification it is clearly showing how Spaniards reconstructed their history, integrating a gender based -and biased- explanation. In other cases, colonialism fueled female domination strategies undergoing in Europe. This becomes evident if we critically analyze the colonial products that were made from the 17th century onwards. The case of the colonial products, as parasols and stays, coming from the Basque fisheries of the North Atlantic makes clear how they took an active part in the colonization of women’s bodies and minds. Deepening in the aforesaid aspects our contribution aims to highlight the diverse strategies for colonizing women that were developed in the context of Early Modern Colonialism.

06 GENDER AND TECHNOLOGICAL CHANGE IN COLONIALISM

Author(s): Rodríguez-Alegría, Enrique (University of Texas at Austin)

Presentation Format: Oral

I propose a hypothetical model of the adoption of ceramic glazing technologies in Central Mexico that focuses on the link between changes in gender status and a growing market for decorated cooking pottery. The model rests on a few independent observations. First, archaeologists working on gender have observed that archaeological narratives of technological change are always implicitly gendered and that we must make gender explicit in our discussion to overcome androcentric bias. Second, historians have argued that the status of indigenous women declined severely after the Spanish conquest. And third, a technology that indigenous people all over central Mexico adopted from the Spanish was lead glazing for ceramics, including for cooking pots. Before the Spanish conquest, Aztec cooking pots were simple and undecorated. After the conquest, women began using glazed cooking pots, some of which have fancy decoration as well as glazing of different colors. Glazed cookware often appears in colonial art, specifically casta paintings, lending some weight to the idea that they were considered beautiful objects and shown with pride. I bring these three observations together to argue that a major driving factor in the adoption of lead glazing was that indigenous women were interested in using beautiful, decorated pottery as their tools in the kitchen. They wanted to show pride in their domestic work, to work with tools that they liked, in a world that had devalued their work and contribution to society as their status diminished. The implication of this model is that not only the production side of technology (in this case, production of glazed pottery), is involved in technological change. The consumption side of technology is also important, as people desire objects and incorporate them into their houses. Thus, the household, and specifically cooking, was central to technological change.

07 RESISTANCE AND PUNISHMENT: TEXTILE PRACTICES AMONG RECHE-MAPUCHE COMMUNITIES IN COLONIAL CHILE (16TH-19TH CENTURY)

Author(s): Marin-Aguilera, Beatriz (McDonald Institute for Archaeological Research, University of Cambridge)

Presentation Format: Oral

Spinning is a practical and embodied knowledge. Different body positions and the particular use of textile tools learnt since childhood make spinning a culturally determined practice. It demands disciplined movement, skill and concentration. The proficiency of Araucanian spinners amazed Spanish colonisers and chroniclers since their first arrival in Chile. Women were capable of spin while walking! Despite the establishment of textile factories, tailor's guilds, and laws in the Americas aiming at controlling the production and consumption of clothing, traditional textile practices and knowledge continued among indigenous communities in Chile. Spinning and weaving reinforced, particularly among the Reche-Mapuche women, technologies of the self and became technologies of resistance against the Spanish colonial rule (1540-1820). Precisely because of the importance of spinning and weaving for being and becoming a Reche-Mapuche female, those textile technologies were taught to and shared with enslaved Spanish women. Spanish captives were forced to marry indigenous leaders and to procreate with them, as well as to dress like a native woman and to carry out the female economic activities within the community, such as spinning and weaving. Through the analysis of textile tools, iconography and ethnographic accounts, this paper explores indigenous textile practices and knowledge as a conscious strategy of resistance against colonial rule on the one hand, and as a punishment and imposition onto Spanish female captives on the other.

08 EMPOWERING DAILY MEALS: GENDER, POWER AND CULTURAL ENTANGLEMENTS IN EMPÚRIES, NORTHEAST CATALONIA (5TH-4TH CENTURIES BC)

Author(s): Ferrer Martin, Meritxell - Delgado Hervás, Ana (Universitat Pompeu Fabra)

Presentation Format: Oral

In recent years, food, foodways and culinary traditions have become a solid line of research in the study of diasporic or colonial contexts and in the analysis of cultural contacts between migrant communities and native peoples. Despite its relevance, in Ancient Mediterranean studies these inquiries have focused mainly on consumption practices and materialities related to extraordinary foods and, particularly, Mediterranean wine. These studies have stressed out the centrality of wine ingest and the materialities associated to its service and consumption in the creation of cultural entanglements, the negotiation of power relationships and social networks as well as the politics of masculinities. On the contrary, the analysis of culinary practices, traditions and materialities related to ordinary food –such as local porridges– have been belittled in the study of cultural contact, gender ideologies, collective identities and power relationships within colonial and migrant communities. They are practices and materialities traditionally related to the domesticity and the feminine sphere, therefore considered as conservative, passive and unrelated to historical, social, economic and power dynamics.

The aims of this communication are twofold. First, to call this dualism between consumption and cuisine in question, and to evidence that this duality has been mostly constructed on colonial and gender-biased perspectives. Secondly, through the study of Empúries' culinary practices and their associated materialities to highlight the active participation of ordinary food in the economic, social and identity politics of this emporion as well as to empower those people who cooked their daily meals, mostly some Ampuritan women.

09 FIRE WITH FIRE: ETHNOSEXUAL CONFLICTS AND RESISTANCES AT THE EARLY COLONISATION OF THE MARIANA ISLANDS

Author(s): Moral de Eusebio, Enrique (Universitat Pompeu Fabra)

Presentation Format: Oral

In 1668, a group of Jesuits landed in the Mariana Islands (Western Pacific) with the aim of evangelising their native inhabitants (the Chamorros). However, this contact soon became an armed clash, since some Chamorros were reluctant to adopt certain practices preached by the fathers.

The aim of this communication is two-fold: First, I will argue that sexuality (and the practices and discourses associated with it) was one of the most controversial points in that conflict. Second, I will analyse, from an archaeological, transfeminist and intersectional perspective, the role played by different materialities in the "ethnosexual conflict" between Spaniards and Chamorros. I will claim that that confrontation was articulated around two buildings, two heterotopias produced from very different sexual epistemologies: the guma' uritao, where young Chamorro males were initiated into adulthood, and the Jesuit school, space where Chamorro boys and girls learnt the Christian doctrine and, therefore, the European sexual standards. The recurrent burning of both buildings by members of the two sides shows both the ferocity with which the Spanish colonial agents tried to implement their evangelising and colonial project and the resistance of Chamorros themselves against such project. Following Barbara Voss, I will conclude that sexuality, far from being a "consensual" and "domestic" element of colonial encounters, in many cases received a public and even violent treatment.

10 MASCULINE PLACE IN LIMINAL SPACE: ASSEMBLAGES OF PRACTICE OF ANGLO-AMERICAN SEAFARERS ON LA TORTUGA ISLAND, VENEZUELA, 1700-1781

Author(s): Antczak, Konrad (University of Amsterdam; Unidad de Estudios Arqueológicos, Universidad Simón Bolívar)

Presentation Format: Oral

This paper foregrounds the role of 18th-century male merchant sea captains as footloose early-modern consumers and drivers of large-scale change. In this paper, Anglo-American and Bermudian captains are considered not as anonymous movers of the burgeoning British mercantile capitalist economy and agents of British colonialism, but as conscious masculine social actors navigating a new and growing array of entanglements between them and the newfangled material things being produced at the dawn of industrialization. Historical archaeological investigations carried out at the campsites of Punta Salinas, by the saltpan of the Venezuelan island of La Tortuga, and the subsequent reconstruction of the vibrant assemblages of practice of dining and drinking there, reveal that once captains began to acquire refined ceramic and glass vessels in the late 1720s and early 1730s, they never stopped. Through their maritime mobilities captains quickly became entrapped in entanglements of enabling dependence and constraining dependency with a growing array of fragile and exotic material things. These male captains not only consumed the 'fruits of empire' but also reformulated and readapted elite masculine and feminine British practices to their new social contexts, and – in the case of Punta Salinas – to a uniquely liminal and temporary campsite on an arid and uninhabited island. Middling Anglo-American and Bermudian sea captains selectively adopted refined Georgian practices, thereby restructuring the gendered practices of the urban elite, influencing British ceramics manufacture, and strategically making these practices their own in their untethered maritime world. In this way, male sea captains were at the forefront of innovating with gendered Georgian gentility beyond the home, ushering in modernity by way of the sea.

11 GENDER AND AGEING IN COMPLEX SOCIETIES: FACING GENDER IN THE FUNERARY PRACTICES OF ELDERLY AT MONTE ALBAN, OAXACA, MEXICO

Author(s): Martins de Alencar, Soraya (Escuela Nacional de Antropología e Historia - ENAH)

Presentation Format: Oral

In the past decades, ethnographic documents produced in the Sixteenth Century illustrating iconographic representations of the body have been consolidated as an important source of information to explore gender identity in Mesoamerican archaeology. Because these documents were published with explanations provided by the Spanish friars, the presupposition in the interpretation of these sources has ignored agency in both female and elderly status. Therefore, the differences between genders in the representations have been analysed by the archaeologists through stereotypical gender-specific elements in the construction of the appearance of the body, and they neglect mixed-gender attributions as in the case of aged bodies. These mixed-gender attributions of ageing open up the consideration of questioning Colonialism cultural assumptions about how gender and ageing intersects within the mortuary context in complex societies, when the predominance of the use of these sources is given to justify social inequality by gender and age. The goal of this paper is to study gender dimensions of ageing through the analysis of the household burials at the site of Monte Alban (500 BC-AD 1250), which was the center of a state-level society in the Oaxaca Valley during at least AD 200-850. Aged bodies were selected considering pathologies and markers of senescence, such as joint diseases, osteoporosis, traces of wear and tooth loss (n=39; 11,8%). There were no distinction between adornments and objects in the burials that could be specific by male (n=20) or female (n=19) sexed bodies. In addition, the funerary practices suggest that seniors were engaged in occupational specializations of the household and these were not gendered-specific, as ceramic production and trade of prestige goods. On the other hand, gendered processes took place in the mortuary ritual to distinguish some symbolical aspects of longevity to preserve the ancestral memory of the house.

172 MEDIATING PROXIES AND CHOICE IN A STONE AGE WORLD

Theme: Theories and methods in archaeological sciences

Organisers: Nyland, Astrid (Archaeological Museum, University of Stavanger) - Cooney, Gabriel (University College Dublin, School of Archaeology)

Format: Regular session

How do we mediate knowledge generated from both the humanistic and natural sciences in one project? Can methods from different fields play to each other's strengths, or are some more appropriate than others? Is our contemporary focus on the natural sciences in archaeology dictating what we can, or choose, to see in the archaeological record? Inter-disciplinary studies does have the potential to develop new knowledge of past societies and lived lives. The question is, are we there yet?

We seek papers exploring how increasing volumes of ever-more detailed knowledge of the prehistoric physical world support theories of prehistoric social lives, symbolic practices, social mechanisms and societal developments. The natural world sets climatic, topographic, or geological limitations, whereas human creativity, the will and ability to explore and modify one's surroundings, to relate to various elements, new impulses, or resources, are socially situated. Hence, generated knowledge of the composition of the physical world, mass-data resulting

in various identified patterns, can be indicators of conscious choices, preferences, or strategic activities. Furthermore, materials may also contain qualities, 'attention-drawing' elements or phenomena perhaps hard to quantify or verbalize, but are elements that may have made the world make sense for people inhabiting the past too.

Hence, we welcome papers mediating proxies (knowledge from micro- or macrofossils, aDNA, isotope analyses, C14, pXRF, etc.), and choice in a socially situated world. Accepted papers should implement and interpret identified proxies in a wider social context and theoretical framework with case studies, preferably from the Mesolithic and Neolithic.

ABSTRACTS

01 TO POSSESS A 'FAKE' OR AN 'ORIGINAL' - DID THE ORIGIN OF ROCK MATTER IN THE MESOLITHIC?

Author(s): Nyland, Astrid (Museum of Archaeology, University of Stavanger)

Presentation Format: Oral

Identification of origin and distribution of rock is probably the most common use of geochemical analyses in Stone Age research. Can data generated from such analyses be combined with aspects building on theories in sensory archaeology?

Having identified the chemical composition of 80 similar looking greenstone adzes using pXRF, the results demonstrated that most of the adzes originated from one particular quarry. However, a few did apparently not. Adzes that with the naked eye look similar may in fact be from areas far apart. So, if we cannot determine difference in rock based on visual identification today, can we assume that origin mattered to the Mesolithic population? In the county of Rogaland there are at around 700 recorded Mesolithic Adzes made from a variety of raw materials. About 280 had been recorded as made of greenstone supposedly from a particular quarry. 80 selected pXRF-tested adzes confirmed the exploitation and wide distribution from this quarry, even into areas where other raw material sources were closer and more available. This substantiate the notion that rock from designated places was indeed significant. However, can these results also support whether green adzes made of rock not originating at that particular quarry represent a deliberate visual manipulation undertaken in order to gain access to a certain social group or otherwise in the Mesolithic? Did it matter whether one actually possessed an adze from a significant site, or was it enough to display a green 'fake' adze? Did it matter, and if so, to whom?

02 NEWFOUND KNOWLEDGE OF MESOLITHIC SETTLEMENT ACTIVITIES DUE TO THE PRESERVATION OF ORGANIC MATERIAL. A CASE STUDY FROM ROGALAND, NORWAY

Author(s): Meling, Trond (Museum of Archaeology, University of Stavanger)

Presentation Format: Oral

In Norway, it is very rare to find preserved bones and other organic materials at open-air Stone Age sites. Our interpretations of site structure and organization have therefore solely been dependent on the quantity and the distribution of lithic assemblages. The focus of this paper will be bones as proxies to our understanding of Stone Age dwelling sites. I will examine how bones appears in different contexts at settlement sites, and to explore how these contexts reflect diverse activities, including rituals or ceremonies. The base of the discussion will be three adjacent settlement sites from Rogaland in South West Norway. Both radiocarbon dates and the lithic material imply activities in the latter part of the Late Mesolithic and the Early Neolithic, around 4000 cal. BC. The preservation conditions were unusually good and around 50 000 fragments of bones were recovered, mainly from areas thought to be middens. The great majority of the bones are from red deer, but they also includes other mammals, birds, fish, and interestingly also human. The diversity in both structural remains and in the deposition of the bone material reveals an entanglement of activities at the sites, activities that would have been invisible without the preserved bone material.

03 BALANCING ARCHAEOLOGICAL KNOWLEDGE WITH THE BASIS OF CHOICE IN THE USE OF LITHIC SOURCES IN THE NEOLITHIC

Author(s): Cooney, Gabriel (University College Dublin)

Presentation Format: Oral

In the Neolithic people made choices on an daily basis about the utilisation of a wide range of materials. It was through this 'stuff' that they constructed their social worlds. What has survived in the archaeological record has a determining influence on our ability to connect with and interpret those locally focused social arenas, which were linked by the exchange of materials and shared traditions of cultural tradition and practices. A key aspect of the archaeological record for this period is the use of stone at different scales, from the megalithic to the microlithic. Not surprisingly at the core of archaeological practice are classificatory and experimental approaches to categorise this material as the basis for understanding it and geological approaches, such as petrology and geochemical analysis, to assist with key questions such as the sourcing of lithic materials, the scale of use of particular sources and the extent of the movement and circulation of materials. We place these approaches at the heart of our accounts of the past, but we need to focus more explicitly on the question of the relationship between our data-based approaches and how people in the Neolithic actually made decisions about the use of stone. The paper considers this issue using as case studies the structural stones of the passage tombs in the Boyne Valley, Ireland and stone axes, with a particular focus on three island sources; Rathlin Island, Lambay,

04 FUNERARY CHOICES IN NEOLITHIC IRELAND: THE CHANGING TREATMENTS OF THE DEAD IN THE LATER FOURTH AND EARLY THIRD MILLENNIA BC

Author(s): Kador, Thomas (University College London)

Presentation Format: Oral

Recent multi-proxy analysis of the human remains that were excavated more than 100 years ago at the Carrowkeel passage tomb complex in County Sligo, Ireland – combining osteology, AMS radiocarbon dating, isotope analysis and aDNA sequencing, as well as a synthesis of pollen data – offers new insights into the lives and mortuary practices of Ireland's Neolithic populations. The results provide evidence for a complex 'palette' of funerary customs and of how they changed over time. They also offer insights into the makeup of Ireland's Neolithic communities, suggesting Carrowkeel was a ritual centre that served a number of distinct regional populations, highlighted by the presence of possible 'migrants' from distant parts of Europe among those interred. Thirdly, the data hint at a potential relationship between socio-demographic and climatic pressures that may have been experienced by people during the later fourth millennium BC on one hand and the role played by elaborate ritual landscapes such as Carrowkeel on the other. Bringing together these multiple strands of data – as proxies for past people's activities – we seek to obtain a more refined picture of the socially and culturally complex lives of Ireland's Neolithic populations, as they are mapped out across the landscape and to relate these to contemporaneous events further afield.

Co-contributors: Jonny Geber, Robert Hensey, Pádraig Meehan, Sam Moore and Lara Cassidy

05 AN ANTHROPOLOGICAL EVALUATION OF LATE NEOLITHIC HUMAN REMAINS FROM SWITZERLAND

Author(s): Siebke, Inga (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Steuri, Noah (Department of Prehistory, Institute of Archaeological Sciences, University of Bern) - Furtwängler, Anja (Institute for Archaeological Sciences, Archaeo- and Palaeogenetics, University of Tübingen) - Hafner, Albert (Department of Prehistory, Institute of Archaeological Sciences, University of Bern) - Krause, Johannes (Institute for Archaeological Sciences, Archaeo- and Palaeogenetics, University of Tübingen; Max Planck Institute for the Science of Human History, Jena; Senckenberg Centre for Human Evolution and Palaeoenvironment, University of Tübingen) - Lösch, Sandra (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern)

Presentation Format: Oral

The inhumations of the dolmen of Oberbipp (Switzerland) provide a unique opportunity for an in-depth archaeological, anthropological, and paleogenetic study. The aim of this study is to gain insights into burial sequences, burial practice, and reconstruction of the population by combining morphological and biochemical analyses. To investigate the occupation of the dolmen radiocarbon data, from the most often occurring bone, were evaluated in combination with paleogenetic results. The skeletal remains were investigated morphologically concerning their distribution in the dolmen, the minimum number of individuals (MNI), age at death, sex, stature, and pathological / traumatic alterations.

The results of 14C dating show two occupational phases, one between 3350-2950 BC and a second between 2900-2650 BC. Over 1750 complete and fragmented bones and 726 teeth were recovered. Most individuals were found in extended supine position with the head towards the entrance in the south-west. A minimum of 40 individuals representing all age classes (37.5% subadults, 62.5% adults; n=40) and both sexes (42.3% males, 38.5% females, 19.2%=unknown; n=26; based on aDNA) are present. Stature estimations revealed body heights between 155 and 172 cm (n=4, sex=unknown). Age related degenerations, healed fractures, and dental diseases with a caries intensity of 7.9% (49/618), are present.

The first occupation phase most likely persists for just three generations based on the combination of the 14C and paleogenetic results. The morphological data indicate a population structure similar to other Neolithic burials from Switzerland. Age related degenerations and healed fractures indicate a considerable population with no signs of trauma related to warlike events. However, the caries intensity is increased in contrast to published data from contemporary sites. With stable isotope analysis, it might be possible to evaluate this deviation further, and gain a better understanding of Swiss Neolithic dietary habits.

06 PROJET JADE/JADE 02: USING 'HARD SCIENCE', INTEGRATED WITH ARCHAEOLOGICAL THEORY AND ANTHROPOLOGICAL INSIGHT, TO UNDERSTAND NEOLITHIC SOCIETIES IN EUROPE

Author(s): Sheridan, Alison (Dept. Scottish History & Archaeology,) - Pétrequin, Pierre (University of Besançon) - Errera, Michel (Freelance) - Nicolas, Clément (Université Paris 1 - Panthéon-Sorbonne)

Presentation Format: Oral

Projet JADE and JADE2 were major research projects, funded by the Agence Nationale de la Recherche and directed by Dr Pierre Pétrequin, that set out to understand the phenomenon of the production and long-distance circulation of axeheads and other artefacts of Alpine jades (jadeitite, omphacitite, fine-grained eclogites, nephrite and paragonite) in Neolithic Europe. The last two volumes of a set of four describing the results were published in 2017. This research has succeeded in shedding new light on the value systems, beliefs and social organisation of societies across Neolithic Europe, and has revealed a greater degree of social differentiation than had been suspected. It has also been able to distinguish between a 'Europe of jade' in the west, and a 'Europe of copper' in the east during the fifth millennium BC, with these two materials offering a mirror image of symbolically-charged, socially-valourised

materials. Key to the success of JADE and JADE2 has been the integration of 'hard science' techniques with rigorous archaeological fact-gathering (through systematic field survey and sampling of source areas in the Alps and a thorough review of all dating and contextual evidence across Europe, undertaken through international collaboration), and with a sensitivity towards the meaning of substances and objects informed by a quarter century's ethnoarchaeological research by Pierre and Anne-Marie Pétrequin among stone axehead-manufacturing and using communities in Papua New Guinea.

07 TERMINAL PLEISTOCENE AND HOLOCENE DIETARY PATTERNS AT THE PAISLEY CAVES, OREGON, USA

Author(s): Blong, John - Shillito, Lisa-Marie (Newcastle University) - Jenkins, Dennis (University of Oregon)

Presentation Format: Oral

The first settlers of North America arrived in the terminal Pleistocene and appear to have quickly adapted their lifeways to settle the varied ecological landscapes they encountered. In many parts of the continent these lifeways changed at the Pleistocene/Holocene transition as people adapted to Holocene climate change. This is particularly evident in the Great Basin region of North America, where initial settlers organized their settlement systems around the Pleistocene pluvial lake and wetland landscape they encountered upon arrival, then reorganized their settlement systems to mitigate a shift to an arid climate in the Holocene. The Paisley Caves in south-central Oregon provide a unique opportunity to investigate human subsistence strategies over time in the Great Basin. The Paisley Caves have produced an assemblage of human coprolites from terminal Pleistocene through late Holocene contexts, providing an important resource for a diachronic study of human dietary response to environmental change. This study looks at pollen, phytolith, and starch microfossils and plant and animal macrofossils recovered from the Paisley Caves coprolites to reconstruct dietary choices made by terminal Pleistocene through the late Holocene occupants of the caves. The goal of this research is to reconcile the record of prehistoric human food choice at Paisley Caves with environmental data from the surrounding region to assess how changing terminal Pleistocene and Holocene environments may have influenced human dietary patterns. A broader goal of this study is to provide insight into multiproxy methods for reconstructing prehistoric human diets.

08 INTERDISCIPLINARY STUDIES OF THE MIDDLE AND LATE STONE AGE SITES IN THE CHASHKINSKY ARCHAEOLOGICAL REGION (UPPER KAMA BASIN)

Author(s): Lychagina, Evgeniia (Perm State Humanitarian Pedagogical University) - Zaretskaya, Nataliya (Geological Institute of RAS) - Trofimova, Svetlana - Lapteva, Elena (Institute of Plant and Animal Ecology, Ural Branch of RAS) - Chernov, Alexey (Moscow State University)

Presentation Format: Oral

The study area is situated in the Cis-Urals flatlands, in the basin of the Kama river. The Chashkinskoe Lake is now a system of oxbow lakes interconnected with abandoned channels. Since 2012, we realize paleoecological and archaeological studies in this area.

Now, 5 Mesolithic and 11 Neolithic sites are known so far in the Chashkinskoe Lake neighborhood. Palaeochannel analysis allowed to identify 7 Holocene floodplain generations. The most ancient is the 7th dated back to 9000-8200 cal BP. At that time, the initial habitation of the region developed and Mesolithic sites appeared. Neolithic sites developed together with 6th floodplain generation formation ~7500-6000 cal BP.

Palaeoecological studies (spore-pollen and carpological analyses) included palaeochannel hand drilling, as well as sampling on archaeological sites. The main implications are as follows: in the first half of the Atlantic period (Mesolithic) there was a waterlogged sparse forest by the oxbow lake with reeded coasts; it was replaced then in the middle Atlantic (Neolithic) by spruce-birch forest, followed by a gradual bogging of the lake with the formation of flood-plain alder thickets.

The results of the archaeological studies showed that if in the Mesolithic various forms of hunting played the leading role, then in the Neolithic, along with hunting, fishing developed actively.

This study was supported by RFFR, project 17-46-590037.

09 NICHE CONSTRUCTION IN MESOLITHIC IRELAND

Author(s): Perkins, James - Basell, Laura - Plunkett, Gill (Queen's University, Belfast)

Presentation Format: Oral

In 1984 Bradley wrote that "... Neolithic farmers had social relations with one another, while their Mesolithic forager predecessors had ecological relations with hazel nuts." Since then, many researchers have sought to move away from environmentally deterministic interpretations of Mesolithic lifeways and in recent years, new approaches have permitted a more nuanced incorporation of palaeoenvironmental and palaeoecological data which address the complexities of diachronic human-landscape relationships. Recent inter-disciplinary studies from Britain that combine Niche Construction Theory (NCT) with high-resolution palynological and archaeobotanical analyses show that Mesolithic people in Britain were actively managing wild plants, creating small-scale woodland clearances and systematically exploiting economically important plants (Rowley-Conwy & Layton 2011; Bishop et al. 2014).

By contrast there are only hints from the archaeobotanical and palynological evidence to support the idea that Mesolithic people in Ireland were actively managing woodland. Very little is known about land-use and plant-use specifics in Mesolithic Ireland because: (a) minimal research into human-induced woodland disturbances has been conducted in Ireland since the 1970s, (b) potential disturbances in palynological records covering the Mesolithic were potentially overlooked due to a lack of high-resolution analyses,

(c) few detailed palaeoenvironmental investigations have specifically targeted areas with Mesolithic archaeology, (d) suitable peat deposits were unavailable at many sites. This paper will assess the current state of knowledge regarding land-use and plant-use in Mesolithic Ireland, and new results will be presented from the high-resolution analysis of peat sequences taken from the vicinity of several key Irish Mesolithic sites. The sequences were analysed at multi-decadal (10-30 year) resolution for pollen, fungal spores, charcoal, tephra and ^{14}C to identify patterns of forest clearance and fluctuating levels of human activity throughout the Mesolithic.

10 PROBLEMS WITH DATING, OR DATING THE PROBLEM? TRYING TO IDENTIFY SETTLEMENT STRUCTURES IN THE EARLY NEOLITHIC IN SOUTHWESTERN NORWAY

Author(s): Eilertsen, Krister (Museum of Archaeology, University of Stavanger)

Presentation Format: Oral

This paper is a contribution to understanding Early Neolithic houses in Southwestern Norway. That is, it is an example where promising archaeobotany results and 'classical' archaeologically based interpretation was contradicted by radiocarbon dates. My points of departure are recent results from an excavated settlement site where lithic distribution in a presumed pit dwelling appeared to represent one of the first such type of settlement from the region. Sheltered from wind by turf walls dug down into the sand, this structure appeared to be a short-term living space used primarily for hunting and gathering activities in the Early Neolithic. The results are similar to features found in southern Sweden and Denmark.

We were all excited about this find: unearthing complex structures such as this hut would highlight and expand our knowledge of settlements and social organization in the Early Neolithic. Considering artifact distribution together with archeobotanical material can also answer questions of economic resource exploitation and perhaps even storage strategies in this period. The site was dated typologically by artefacts and raw material common in the Early Neolithic, but we should have stopped there; as it turned out, results from radiocarbon dated macro-fossils, pottery, and bulk shard organics, came back rejecting the initial typological dating. So what are we left with? An uprooted tree? Alternatively, an organic structure that, over time has devoured/ absorbed material from layers and activity surrounding it? Can this site still be used to study dwelling in the Early Neolithic?

a. PROVENANCE STUDIES (PXRF) OF MIDDLE NEOLITHIC POTTERY IN FALBYGDEN, SWEDEN

Author(s): Bakunic Fridén, Imelda (Rio Göteborg Natur- & kulturkooperativ; Project: Neolithic Lifeways) - Blank, Malou (Gothenburg University; Project: Neolithic Lifeways)

Presentation Format: Poster

The Falbygden area in southern Sweden has the densest megalithic grave sites in Sweden. In recent years, a number of Neolithic settlements have been discovered and investigated. Together with the largely unpublished material from other excavations, this gives us new opportunities for detailed analyses. These ceramic analysis results are a part of a larger project, Neolithic Lifeways, and deals with the questions of identifying and interpreting provenance of Funnel Beaker culture pottery in Falbygden. In addition to huge amount of FBC ceramics, we also have sherds in the material from the Pitted ware culture.

The pXRF technique enables us to contribute new aspects of the pottery which can complement and be compared to more traditional ceramic analyses. By elemental analysis of ceramics and of clay, compared with background geological information and reference samples, indications of where the raw material was taken from can be revealed and local/ nonlocal pottery production and circulation of pottery can be discussed. In this project we analyzed ca 170 samples from settlement sites and megalithic tombs in the Falbygden area and comparative samples from surrounding regions. This study will contribute to the understanding of regional networks during the Neolithic, help us understand prehistoric social lives and the social mechanisms that played a role.

b. GLOBOTRUNCANA AS ANCIENT PATHS ILLUMINATORS

Author(s): Sosic Klindzic, Rajna (Faculty of Humanities and Social Sciences University of Zagreb)

Presentation Format: Poster

Early Neolithic in the present day Eastern Croatia is characterized by the predominance of one type of siliceous rock as the raw material for stone tool production. This particular raw material use in everyday life was limited to area between Sava, Drava and Danube rivers in space. It also had limited time span as it was used only during the Starčevo culture. With its end, this raw material was no longer used for tool production. Later Neolithic communities used more opportunistic ways of raw material procurement – they were using radiolarite pebbles easily obtained from the Sava and Drava river beds. This particular raw material was often mistaken for radiolarite because of its macroscopic characteristics and similarity to radiolarites that are abundant in the surrounding Dinaric Ophiolite Zone (DOZ). However, petrological analysis revealed presence of Upper Cretaceous foraminifera globotruncana. Petrological and subsequent geochemical analysis proved that early Neolithic population between Sava and Drava rivers exploited and used silicified limestones of Upper Cretaceous age from NW part of Sava-Vardar zone. The outcrops belong to the greater masses of Upper Cretaceous carbonate rocks which are tectonically in discordant position to the DOZ. Outcrops are located 30-50 km south from the river Sava where sites with biggest lithic assemblages are situated. Samples from 8 archaeological sites were analyzed and compared to the samples from outcrops. All of the samples were Upper Cretaceous silicified limestones. These results showed that geochemical, as well as petrologic data are very important for understanding the processes of decision making, raw material procurement, production, use and distribution of stone tools by prehistoric population. Further on, it revealed to us the elaborate and

complex use of environment and a preference for a particular type of raw material regardless of its accessibility.

c. MIDDLE PALAEOLITHIC STRATIFIED OPEN-AIR SITES: INTEGRATED STUDIES IN THE CENTER OF THE RUSSIAN PLAIN

Author(s): Zaretskaya, Nataliya (Geological Institute, Russian Academy of Sciences) - Otcherednoy, Alexander (Institute for the History of Material Culture, Russian Academy of Science) - Voskresenskaya, Ekaterina (Institute of Geography, Russian Academy of Sciences) - Stepanova, Ksenia - Larionova, Alisa - Vishnyatsky, Leonid - Nehoroshev, Pavel (Institute for the History of Material Culture, Russian Academy of Sciences)

Presentation Format: Poster

The presentation is devoted to the preliminary results of interdisciplinary studies of stratified open-air Middle Paleolithic (MP) archaeological sites Khotylëvo I and Betovo, located in the upper reaches of the Desna river on its right bank. The sites coincide to the forelands of gully system, which opens directly into the floodplain. The cultural layers lie in the valley slopes, i.e. transition zone from the floodplain to the terrace. The sedimentary succession is composed of alluvium (lower part with most of cultural layers) and slope deposits (upper part, with 1 or 2 cultural layers).

The bedding of cultural remains can remain in situ, slightly moved or redeposited. Archaeological assemblages are of bifacial and Levallois technologies variability together with Keilmessers and thinning flakes. Therefore they could be analyzed as a base for the Micoquian variability determination for open-air sites.

Of special interest are series of AMS and conventional radiocarbon dates obtained on charcoal, bone and humus samples. The dates confirm our previous conclusion (based mainly on palaeomagnetic, lithological and stratigraphic evidence) that the deposits enclosing the MP assemblages should be dated to the first half and the middle part of MIS 3. Ca 30 dates obtained by now for 49.7 to 23.9 14C BP. Chronometric studies are carried out including the use OSL method.

Our results allow us to correlate tentatively the habitation of the center of Russian Plain in the Middle Palaeolithic with main climatic events of MIS 3, to assign the reference geoarchaeological sections and focus the main topics for the further study of the Late Middle Palaeolithic on the open air sites of Central and Eastern Europe.

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OUT OF THE PAST INTO THE FUTURE – PROFESSIONAL COHESION THROUGH DIVERSITY

Theme: Archaeology and the European Year of Cultural Heritage

Organisers: Smits, Vivian (SVK - Västarvet Studio Västsvensk Konservering; Linnaeus University, GRASCA) - Jones-Amin, Holly (The Grimwade Centre for Cultural Materials Conservation – Commercial Conservation Services UoM Commercial Ltd) - Yoshida, Maruchi (YCONS Yoshida-conservation) - Joosten, Ineke (Cultural Heritage Agency of the Netherlands) - Godfrey, Evelyne (Uffington Heritage Watch)

Format: Session with presentations of 6 slides in 6 minutes

The aim of this session is to promote cooperative practices between heritage experts within the archaeological process. The breakup of field archaeology from a governmental controlled activity into a competitive market has had a huge impact on the archaeological process in many countries. Similar organisational changes are also apparent in other specialist fields, for example, the contracting of commission based conservation studios at the expense of museum conservators is increasingly common in European countries. Consequently, heritage experts' goals can be fragmented and diverse.

Consolidating the various expert roles within the archaeological process will combine our strengths and counteract this fragmentation. A dialogue on the common goals in the archaeological process, establishing how these goals can be reached, is needed to assure adequate scientific results and increase awareness on the significance of heritage in contemporary society. This will open up the possibility of finding new and innovative ways to present archaeology as well as heritage preservation and appeal to divergent groups in society.

This ClfA-affiliated session will include discussion about the potential formation of a new ClfA "Conservation and Materials Science" Special Interest Group, consolidating conservation as part of the archaeological process. Session organisers welcome contributions where co-operation between stakeholders stands as a key factor for example:

- Heritage preservation as a means of social identity marker and foundation of social cohesion (e.g. integration of ethnic communities; recovery after crisis; etc.).
- The professional role of the conservator: the integration of conservation in archaeology and accreditation as heritage professionals.

01 THE CONSERVATOR AS COMMUNICATOR, CONCILIATOR AND CONNECTOR – THINKING AND ACTING OUTSIDE OF OUR PROFESSIONAL COMFORT ZONES

Author(s): Yoshida, Maruchi (YCONS Yoshida-Conservation; kurecon Kulturgutrettungscontainer)

Presentation Format: Oral

This contribution will give some views and suggestions on the central idea of the session - the “dialogue on common goals”.

Conservators discuss the goals of conservation, restoration and to some extent of display. Most of our effort is to explain conservational requirements to our colleagues (other conservators, archaeologists, curators etc.) negotiating about priorities and necessities. Obviously, we are discussing about common goals – the preservation, research and presentation of cultural heritage – from different professional views though, but being in a common ‘habitat of cultural heritage experts’.

If we consider what affects the long-term preservation of cultural heritage the most, we state, that policy shift, and the transformation of environment and urbanization are crucial. Thus, our today’s challenge is to claim the relevance of cultural heritage towards a fast changing society. This means our dialogue partners whom we want to convince are sitting outside of our ‘habitat’.

Therefore, we have to step out of our professional comfort zones and explore unfamiliar fields of expertise. We have to accept that decisions are made in a political process – that means scientific arguments regarding preservation of cultural heritage must be connected to other social and economic aspects in order to enhance their importance. Finding the right dialogue partner and a common language are crucial, and mutual understanding of interests and needs on both sides is indispensable to agree on goals and to create shared benefits. But life is complicated – the requirements are complex, the communication structures are not transparent, the strategies of decision makers and interests of stakeholders often remain unclear.

This paper will make an excursion to the fields of political research and social sciences and will present different communication formats and conciliation techniques which we can adapt and take advantage of.

02 LET’S TALK ABOUT THIS!

Words matter, choose them carefully.

Author(s): Smits, Vivian (SVK - Västarvet Studio Västsvensk Konservering; Linnaeus University, GRASCA) - Jones-Amin, Holly (The Grimwade Centre for Cultural Materials Conservation - Commercial Conservation Services UoM Commercial Ltd)

Presentation Format: Oral

This discussion topic centers on the consequences of our language choice when dealing with cultural heritage as heritage specialists. Ultimately, the overall intention of contract archaeology is to produce relevant scientific knowledge, preserve material culture and communicate knowledge about the past. The material culture produced is the sum of a process involving many stakeholders, and just as many subjective choices and values. Our choice of language when relating to material culture, is not only reflecting how we value it - it affects our actions as well. Consciously and subconsciously, language influences what we deem valuable, thus affecting choices on what to preserve and what not. The language we use in our communication outwards affects how the public relate to archaeology and its “products”, i.e. material culture. This can have a huge impact on the success rate of educating, engaging and including the public in any kind of heritage project. How we name and refer to material within the archaeological process should be consistent for all stakeholders. A shared terminology is beneficial for cooperation between stakeholders and makes it easier to work towards the same overall goals. It will minimize subjective choices with a possible loss of important information in selection processes. Finally, it will result in a united professional voice in the production of knowledge on and communication about the archaeological process itself.

Questions to discuss are:

- Which words or phrases are most suitable to use in the archaeological process? In our communication towards the public? Which should be avoided?

- How could a united professional voice use the strength of words in communicating the archaeological process?

03 DO ARCHAEOLOGISTS LEARN ABOUT CONSERVATION IN THEIR STUDY PROGRAM – AND VICE VERSA? A CRITICAL EXAMINATION OF UNDERGRADUATE STUDY PROGRAMS

Author(s): Gutmiedl-Schuemann, Doris (Freie Universität Berlin, Institut für Prähistorische Archäologie)

Presentation Format: Oral

The professional roles of archaeologists on the one hand, and of conservators on the other hand, are mainly shaped during study times and professional training of future colleagues. Currently, 31 German universities offer undergraduate, i.e. Bachelor study programs in the field of archaeology; 9 universities or universities of applied sciences offer study programs for the field of conservation.

Conservators and conservation are important elements within the archaeological process, but this might not be obvious for students of archaeology right from the beginning. So, I would like to present some results on a comparative survey of study guidelines and examination regulations, especially by addressing the following questions:

- Do students of archaeology learn about conservation? If so, at which stage of their study program, and to which extend?
- How do they learn about conservation?
- Are professional conservators included in teaching this topics?

The same kind of questions should be afterwards applied to the study programs of conservation, its study guidelines and examination regulations asking about if, when and to which extend the students there learn about archaeology.

With my paper, I would like to address the topic "the integration of conservation in archaeology" by a critical examination of undergraduate study programs in Germany. I would like to discuss, whether a better inclusion of conservation topics in study programs of archaeology would strengthen the role of conservation in archaeology and among heritage professionals.

04 THE CONSERVATOR'S ROLE IN ARCHAEOLOGICAL FIELDWORK - A PRACTICAL EXAMPLE FROM THE EXCAVATION OF NYA LÖDÖSE

Author(s): Skogbert, Madelene (Studio Västsvensk Konservering)

Presentation Format: Oral

The participation of field conservators at the excavation of the late medieval city of Nya Lödöse in Gothenburg, Sweden, has had a positive impact on the archaeological process. As the largest excavation ever in west Sweden, the project Nya Lödöse has shown to be a unique example of the many benefits of a close collaboration with conservators in contract archaeological commissions. Easing the work-flow in the field, facilitating the care for finds and the administration surrounding them, the involvement of a conservator on site has shown to be an effective and cost-efficient way of working.

The active role of the conservator in the field facilitated a continuous dialogue between the archaeologist, the conservator and - to a certain degree - the museum staff. This aided the handling of archaeological materials in many ways, minimizing the handling of objects, and limiting the time for exposure to the elements. Complex finds could be taken care of immediately, in an optimized way for each particular find. This cooperation also brought along a higher level of understanding of, and respect for, each other's fields of expertise.

This presentation will focus on the mutual benefits of collaboration between archaeologists and conservators in contract archaeology. It aims to raise the awareness on the many advantages in such a strategy for all participants in the archaeological process.

05 AMOR - LEADING TO AN INNOVATIVE, INTERDISCIPLINARY STRATEGY AFTER EXCAVATION FOR PRECIOUS METAL

Author(s): van der Stok, Janneke - Bommel, Maarten (University of Amsterdam) - Joosten, Ineke (Cultural Heritage Agency of the Netherlands) - Beentjes, Tonny (University of Amsterdam)

Presentation Format: Oral

This presentation aims to discuss the development of an innovative strategy on post-excavation handling and care of precious metal finds. The success of information extraction on these objects depends on a number of stakeholders in the archaeological process and thus requires interdisciplinary collaboration.

Archaeological precious metals contain a wealth of information. The surface especially, where surface decoration and platings are present, can aid in understanding the culture of our ancestors. However, that same surface is subject to degradation, and interventive conservation treatments like polishing can have a negative influence on the readability of the metal. It is therefore significant that relevant information about the object and its context will not be lost after excavation. The project is thus seeking for the best way to extract information from archaeological precious metals before it is lost through post-excavational degradation and/or conservation treatments.

The 'Palmhoutwrak', a shipwreck recently found in the Netherlands, contains a unique group of objects made of precious metal. These probably belong to a nearly intact 17th-century personal ensemble, a unique set without known historical parallels. The items are also interesting from a material-technical point of view, since they are in a practically pristine, unworn state. Research into these precious metal objects will result in valuable information. This will lead to a better understanding of the objects and their association, also with the other finds from the wreck. In addition, the applied method of study can lead to an improved strategy after excavation for precious metals from an archaeological context.

The focus will primarily be on the possible steps necessary to extract relevant information as optimally as possible, with the application of a selection of state-of-the-art analytical techniques, such as X-ray imaging and Scanning Electron Microscopy coupled to an Energy Dispersive X-ray detector (SEM-EDX).

06 PUTTING THE WHOLE STORY ON DISPLAY THE INCORPORATION OF SPECIALIST ANALYSES IN MUSEUM DISPLAYS: A DUTCH/FRENCH EXAMPLE

Author(s): de Looft, Deandra (Leiden University) - Joosten, Ineke (Cultural Heritage Agency of the Netherlands) - King, Andrew (Psiché Synchrotron Soleil) - Bertrand, Loïc - Gueriau, Pierre - Li, Jiayi (IPANEMA European Research Platform on Ancient Materials) - Jansen, Richard - Vaart-Verschoof, Sasja (Leiden University)

Presentation Format: Oral

Through the break from governmental control in archaeology and its subsequent commercialisation, money has become a big factor in influencing how archaeological research is conducted. This, in turn, has influenced the way how archaeologists, experts and museums collaborate.

In this talk, I will give an example of how innovative interdisciplinary research can give new insights on old materials, while at the same time a way can be found to display these scientific results to the public in an interesting and engaging manner.

As an example, I will discuss my own experience with an international interdisciplinary collaboration, in which we analysed 3D microstructures of prehistoric archaeological textiles through the use of synchrotron-based micro-computed tomography (μ -CT). This research was only possible through the intensive collaboration of archaeologists, material specialists, synchrotron scientist and heritage experts.

Specific focus will be placed on how this kind of specialist analyses can be brought to the public in an interesting and interactive way, without compromising its scientific integrity.

The discussion will focus on what kind of collaboration is needed between archaeologists, specialists and heritage experts to reach these new levels of interpretation, and how at the same time the results can be made interesting for the general public.

07 DIGITAL OUTREACH IN THE FIELD

Author(s): Van de Ven, Annelies (University of Melbourne)

Presentation Format: Oral

"Excavation is destruction" is a sentence every archaeology students hears at some point in their first-year courses. With every stratum we dig, we are not only removing the material that we study from its context, but often we are also exposing these materials to increasingly severe degradation processes. We are told that good recording methods can help to offset these issues, but in reality, the issue is far more complex, especially considering present day financial and physical threats to archaeological sites, materials and projects.

International teams collaborating across several institutions on different schedules need to share data in real time. Public outreach needs to be included to ensure continued relevance and funding. Data needs to come in easily transferable file formats to keep up with swift technological changes. Unexportable artefacts need to be extensively and realistically recorded to ensure future accessibility to all parties involved.

Archaeologists, software engineers and research scientists are working together and have developed a number of tools to solve these problems. Advanced imaging technologies like RTI and photogrammetry, allow us to share detailed models of the objects and areas we are excavating that can be shared almost instantly with conservators, material or language specialists, and the wider public, as well as ensuring long term durability of data. Mobile apps like iDig, OneNote, ARK and Tap forms allow easy data recording as well as data exchange in the field, between the field and the lab as well as external stakeholders.

My paper will highlight the basic utilities of advanced digital imaging and in-field recording technologies, highlighting their significance to key issues and goals in present-day archaeology including outreach, conservation, and data mutability.

08 A UNIQUE DATA CARRIER: A STUDY OF MARITIME-ARCHAEOLOGICAL GILDING, DE COLORANDO AURO AND CONSERVATION PRACTICE

Author(s): Kuiper, Elisabeth (University of Amsterdam)

Presentation Format: Oral

The removal of (superficial) corrosion layers on (maritime) metal objects is a standard practice in conservation. This study and its results give insight in research opportunities prior to the removal of corrosion layers. The aim of this contribution is to highlight the urge for a closer collaboration between heritage specialists such as the archaeologist, the conservator and the materials scientist in order to extract as much as scientific information from the objects as possible.

Standard conservation treatment usually involves the removal of disfiguring corrosion layers as they can cover decorative surfaces and features of the object entirely. However valuable information is at risk as these corrosion layers may preserve original material or traces of manufacturing processes.

This research has examined a gilded maritime archaeological object from a shipwreck off the coast of Texel for traces of de colorando auro color treatments. In past times less noble metal objects were often fire gilded to enhance their appearance. The evaporation of the mercury resulted in a dull and unattractively colored surface. Therefore, after the gilding process the color and appearance of the gilding was heightened by addition of a final step, which Theophilus (12th century) calls de colorando auro. Although historic texts like Theophilus or Cellini (15th century) give insight in this practice, the material itself seldom remains on the object. Recent

studies have deepened the knowledge on deliberate surface alterations and coatings on the surfaces of gilded objects.

In this study clear indication of the presence of original material and residues of coloring treatments were found in the external corrosion layers of a maritime archeological object: traces of beeswax and indication of the associated heat treatment were found. Consequently, revision of standard conservation practices regarding these objects seems in order.

09 CIFA SPECIAL INTEREST GROUPS

Author(s): Hinton, Peter (Chartered Institute for Archaeologists)

Presentation Format: Oral

This paper will briefly set out what a ClfA special interest group (SIG) is and how a SIG can be established. It is hoped that this will help inform the discussion outlined in the session abstract.

ClfA is the leading professional body representing archaeologists working in the UK and overseas. We promote high professional standards and strong ethics in archaeological practice, to maximise the benefits that archaeologists bring to society. We are the authoritative and effective voice for archaeologists, bringing recognition and respect to our profession.

- Archaeology adds value to industry and to society
- ClfA champions professionalism in archaeology by setting standards, measuring compliance, promoting best practice and sharing knowledge
- Members of ClfA are accredited and skilled in the study and care of the historic environment
- Accreditation in archaeology recognises the professionalism of practitioners, improves their careers and attracts new people into archaeology
- Using accredited archaeologists assures clients that the work will meet their needs and the needs of the public

ClfA currently has four area groups (Scotland, Wales/Cymru, Deutschland/Germany and London) and 16 Special Interest Groups covering a range of specialist sub-disciplines of archaeology and a variety of issues affecting professional practice. The groups nominate representatives to ClfA's Advisory Council.

10 PROFESSIONAL COHESION IN ARCHAEOLOGICAL CONSERVATION

Author(s): Godfrey, Evelyne (Uffington Heritage Watch)

Presentation Format: Oral

The Chartered Institute for Archaeologists (ClfA) publication "Standard and Guidance for the collection, documentation, conservation and research of archaeological materials" (2001; revised 2008) is a brief seven page document that includes two mentions of conservators. One mention is just to say that conservators should be credited in the publication for their contribution to the finds work. The other mention is in paragraph 3.4.4 under "Fieldwork", and says: "Provision should be made to consult designated conservators and other specialists in circumstances which require specialist advice." While perhaps necessarily vague, this guidance raises some immediate questions, such as, "Who is a 'designated conservator', and how and by whom is that designation decided?", and is it only exceptional "circumstances" that require specialist advice, not 'everyday' archaeology? This contribution will briefly outline current discussion in the UK Institute of Conservation (ICON) Archaeology Group about the potential for the formation of a new ClfA "Conservation and Materials Science" Special Interest Group, to complement the established ClfA "Finds" Special Interest Group. The aim of a Conservation & Materials Science SIG would be to achieve better integration of conservation and materials analysis in the archaeological process, including post-excavation research. The professional roles of the conservator and archaeological materials scientist, and their accreditation as heritage professionals will be discussed too.

184 PERSPECTIVES ON THINGS, PEOPLE AND PLACES AD 1500-2018

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Mytum, Harold (University of Liverpool) - Escribano-Ruiz, Sergio (University of the Basque Country)

Format: Regular session

Archaeological research on the material culture of Europe in the historic period offers opportunities for highly contextualised study and analysis from the scale of a named individual or event right up to large-scale continental and global processes such as consumerism and colonialism. The papers will be relevant to the Barcelona theme of 'Reflecting futures' by examining how understanding individuals, groups and wider processes of the recent past provide windows into our contemporary and future world. This session will provoke consideration of how the relatively recent past affects the present. North American and Australasian historical archaeologists have been more willing to engage with current societal challenges through their archaeology than those in Europe. This session, sponsored by the Society for Post-Medieval Archaeology, will allow these issues to be discussed within a European context. Current problems such as recession and stagnation, nationalism and regionalism, sexism and racism, imperialism and globalisation, can all be usefully explored for the recent past to better understand the Europe of today and tomorrow. These studies can examine how individuals or communities operated within these larger parameters, or can examine

these wider processes, all from a material perspective.

ABSTRACTS

01 CAN THE SUBALTERN SPEAK? THE INHABITANTS IN A "SMALL GREY TOWN" AND THEIR LEGACY

Author(s): Svensson, Eva (Department of Life and Environmental Sciences, Karlstad University) - Nilsson, Pia (National historical Museum, Archaeological division) - Hansson, Martin (Department of Archaeology and Ancient History, Lund University)

Presentation Format: Oral

The clustering of poor people and badly built houses in designated areas was common in rural Sweden up in the early 20th century in Sweden. Often such clusters, rural slum-areas, were located on environmentally poor marginal land, on the fringes of parishes or other «left over»-spaces where natural conditions offered few opportunities to make a living of the land. Some tried, mostly as craftsmen of different kinds, others were forced to seek employment at long walking distances from their homes. The inhabitants of such clusters were attributed bad reputation, as poverty was connected to inferior moral standards.

In this paper a rural slum-area, called "the little grey town", will be presented. Here almost hundred households were settled on poor soils in shabby buildings. The inhabitants were making their living on handicraft and odd jobs inside as well as outside and on the fringes of the law. "The little grey town" suffered a variety of pressures from the outside, especially from prospective mining activities. Still, there appear to have been a strong connection between the inhabitants of "the little grey town" and a congregation of The Mission Covenant Church of Sweden in a nearby village of freeholding peasants. Through the congregation this particular rural slum-area has been preserved in a living, but changing, local tradition, but very little is retrievable through archaeological survey as the poor housing has left few traces.

Apart from "the little grey town", rural slums tend to be forgotten. It is problematic retrieving them archaeologically, not least due to a fragmentation practice in recording of sites. Here another rural slum, surveyed in a rescue project, will be used to shed light on a plethora challenges for transmitting the legacy of rural slums to the future.

02 INTERDISCIPLINARY STUDIES OF MATERIAL CULTURE OF MODERN TIMES ON THE EXAMPLE OF THE CEMETERY AND THE CHURCH IN PŁONKOWO

Author(s): Grupa, Malgorzata (Nicolaus Copernicus University; Department of Archaeology) - Nowosad, Wiesław (Nicolaus Copernicus University; Department of History)

Presentation Format: Oral

Archaeology and records. Entering archaeology into historical epochs generates natural research contact of both disciplines. Archaeological exploration can be conducted, of course, without historical context, however, this attitude causes strictly documentary (cataloguing) work, and any attempts of crossing that path create possibilities (in historians' opinions) of evident interpretative mistakes, which can be verified in sources. On the other hand, it would be careless of the historians' side not to take under consideration the results and discoveries of archaeological explorations in modern times sites, having even the least connection with material culture. Despite all the advantages, archaeologists and historians' contacts and common projects are rare. In many cases archaeologists and historians have different theories about people and ways of life in modern times settlements. Researchers from Nicolaus Copernicus University in Toruń (Poland) try to change this by working side by side in many projects. This cooperation is perfectly seen on the example of common studies of the graveyard and the church in Płonkowo (Kuyavian-Pomeranian Voivodeship). Researchers tried to confirm archaeological data by cross referencing them with historical written sources stored in diocesan and secular archives. Results of interdisciplinary work between archaeologists and historians are going to be presented as a main subject of this presentation.

03 TRANSFORMATION OF THE SUBURBS BEHIND THE PRAGUE WALLS: A CASE STUDY OF KARLÍN DISTRICT

Author(s): Kucharík, Milan - Blazkova, Tereza (Labrys o.p.s.)

Presentation Format: Oral

Recent archaeological excavations in the former area behind the walls of medieval Prague allowed us to look into the past of this territory. The development of this territory, today's Karlín district, has always been influenced by the interests of the metropolis. In the Middle Ages it was the property of ecclesiastical order, which used the territory as agricultural background.

On the threshold of the Post-Medieval era, a hospital for inconvenient patients which were displaced here from inner Prague during epidemic, was established here. In the next development, pre-industrial production of Jewish merchants, especially those unclean, such as paper mills, tanneries, dye-houses, moved out of the city here. These productions became the basis for the important industrial suburb of Prague, which consisted of large, important industrial factories and the largest river port in Prague in the middle of the 19th century.

Today, this area, which was absorbed by the city at the end of the 19th century, is undergoing a new stage of development. The process of gentrification means here a massive rebuilding and building of a new offices district with prosperous shops that replace

the former industrial face. The last traces of industrial use are disappearing, and recent research is significantly complementing information on former land use, which is often lacking in other sources. It shows up relics of activities and spaces that are melting in new meanings.

04 THE PARADOX OF BEING DANISH. MIGRATION AND DANISH IDENTITIES AT THE TIME OF SHAKESPEARE: RESULTS FROM THE URBAN DIASPORA PROJECT

Author(s): Linaa, Jette (Moesgaard Museum)

Presentation Format: Oral

The kingdom of Denmark is a thousand years old, and strong national feelings centres around our royal family, our flag and our past. That is why the Danish debate on immigration is heated and the rhetoric frequently harsh. However, when a resolution to combat ghettoisation suggested that being Danish and being an immigrant or of immigrant descent were mutually exclusive, the debate reached a peak. But paradoxically, the public rhetoric of Danish ethnic and social homogeneity is at odds with our historical differentiation. This paper aims to go into roots of the Danish identity, that has been developed in a past that is less clearcut and more complicated than the headlines of the press suggests. This paper aims to dig deeper into that paradox and on this quest I will divert into past negotiations on ethnicity and language and belief and everyday practice, in an attempt to shed light on the truths behind this perceived homogeneity of the Danes. In doing so, this paper address subjects as diverse as the specific Danish attitude towards social differences, the Danish additive tone, the Danish cultural heritage, and the Danes' emotional attitude toward our past. The paper takes its starting points in final results of the research project Urban Diaspora – Diaspora Communities and Materiality in Early Modern Urban Centers 1400-1700, funded by the Danish Research Council for the Humanities.

05 CULTURAL ENCOUNTERS: NON-EUROPEAN OBJECTS IN LISBON (1500-1755)

Author(s): Casimiro, Tania (IHC/IAP NOVA University of Lisbon) - Henriques, José Pedro (IAP NOVA University of Lisbon)

Presentation Format: Oral

Archaeological excavations made in Lisbon, or nearby cities, in sixteen, seventeen and eighteen century contexts discovered huge amounts of non-European objects. While Eastern ceramics, the majority of them blue on white porcelain, are the majority of these finds, a number related to the general interest of the population in consuming these items, occasionally one can find objects from other origins in the archaeological contexts.

While the import of Asian ceramics can be related to a commercial interest the presence of African and Southern American objects has to be approached by different consumption perspectives, despite the fact that these are found associated to domestic environments thus used in daily activities. Several items manufactured in Africa, Brazil and even Mexico have been found. While some of them reveal an intrinsic and artistic value with symbolic characteristics others seem to be just things which were used daily in Lisbon households.

This paper aims to discuss the acquisition and use of those objects not only by Europeans but how or if they can reflect the presence of non-European minorities in the construction of the archaeological record and how the presence of different cultures led to changes in daily habits and even food ways, some of them still observed today.

06 INTERWEAVING AFFECTS: OBRAJES, GENDER AND ALIENATION IN COLONIAL CHILE (17TH-18TH CENTURIES)

Author(s): Marin-Aguilera, Beatriz (McDonald Institute for Archaeological Research, University of Cambridge)

Presentation Format: Oral

Chile was the most important and complex borderland of the Spanish Empire (1550–1818), in which colonial power and indigenous resistance were contested over centuries. Given the difficulty to conquer central-southern Chile –the so-called Araucanía–, the Spanish Crown created a permanent army in the territory, very similar to the Army of Flanders. This decision, however, placed the system for provision of army clothing under unprecedented pressure, since its production in Spain was well beyond its capacity to equip a mass army. The Crown opted to establish 'obrajes' (textile factories) in Chile in order to assure the clothing supply to the army. The Spanish elite controlled and organised the production of those factories, as well as the indigenous labour force. Before the arrival of the Spaniards, textile production was a female activity among the indigenous communities in central-southern Chile. Yet, the Spanish colonial administration forced indigenous men to work in the textile factories and to manufacture clothing for the colonial army that was killing and subjugating their communities. This paper explores the exploitation of native workers in the colonial textile industry, and the implications of the shift in gender roles for indigenous people in colonial Chile through affect theory, material culture and archival sources. This research helps us gain a better understanding of the history of the Reche-Mapuche communities in Chile, of gender relations, and of (some of) the consequences of Spanish colonialism.

07 IRISH MATERIAL CULTURE DIASPORA: THE DISPERSAL OF IRISH ANTIQUITIES FOLLOWING THE 1798 REBELLION

Author(s): Bell, David (Queen's University Belfast)

Presentation Format: Oral

The long eighteenth century witnessed several popular uprisings across Europe and the New World. Inspired particularly by those in France and America, the United Irishmen, an alliance of Roman Catholics and dissenting Protestants, planned a rebellion for the summer of 1798. The Irish Penal Laws, however, then in place for over a century, proved effective in denying would-be rebels access to the arms that would be essential to any successful insurrection. The widespread plunder of the homesteads of Protestant tenant farmers and the 'Big House' of the Anglo-Irish landed gentry would provide only limited supplies of firearms. Pikes, essentially any pointed metal implement attached to a long wooden shaft, therefore became the Irish rebel's weapon of necessity if not choice. While local blacksmiths produced copious iron pike heads, a significant number of Bronze Age blades augmented this cache.

Following a brief and bloody conflict, the large quantities of surrendered arms included many reused antiquities then targeted for (re) collection as trophy pieces. If eventually returned to the corpus of curated Irish prehistoric artefacts, as many were, all provenances would have been lost. If they also suffered significant blade-on-blade impact damage, however, it may be possible through use-wear analysis to distinguish this from any pre-existing impressions. When both of these features appear in combination with recent modifications, a compelling case exists for their identification as the weapons of modern insurgents.

The conflation of modern and ancient, probably ritual, damage has resulted in the possibly erroneous modelling of early societies dominated by male warrior elites, a paradigm with contemporary resonances. It is further argued that modified, recently damaged and unprovenanced Irish Bronze Age blades are disproportionately represented in the collections of several British museums, particularly those with an identifiable 'colonial' connection to Ireland at the time of their accession.

08 BRINGING OUT THE DEAD: THE MASS GRAVES OF CONVENT OF S. FRANCISCO (COIMBRA, PORTUGAL)

Author(s): Corga, Mónica (Dryas Arqueologia) - Ferreira, Maria Teresa (Centro de Investigação em Antropologia e Saúde; Department of Life Sciences - University of Coimbra) - Almeida, Miguel (Dryas Arqueologia) - Wasterlain, Sofia (Centro de Investigação em Antropologia e Saúde; Department of Life Sciences - University of Coimbra)

Presentation Format: Oral

Almost 200 years on and the memory of the Peninsular and Liberal Wars still lingers as a narrative mediated through reports and pictures moving inside the dichotomy between what happened and the invisible historical facts. However post-modernist societies tend to emphasize the engaged construction of unique and personal experiences of memories based on what is conflictual, divergent, and particular. Archaeology plays a fundamental part in this perspective by offering diverse readings on different situations of the past and stressing the situational and evolutionary nature of the human knowledge.

We aim to discuss here the collective graves identified during the preventive archaeological excavation at the Convent of S. Francisco (Coimbra, Portugal), used as military hospital during the early 19th century. In fact, most of the 604 individuals exhumed show distinguishing characteristics of a selected (non-natural) population: their sex, robustness, age-at-death, degenerative lesions (suggestive of continued practice of demanding activities), and some lesions, inflammatory and traumatic, allow their association to the military units admitted in the convents of Santa Clara-a-Nova and S. Francisco during the French invasions and Liberal wars.

Thanks to the recent development of meticulous archaeo-anatomical protocols, new perspectives have been unlocked in the understanding of death in war periods, so often rooted on everyday sociability, and therefore more prone to be forgotten in narratives and historic discourses. The information gathered in S. Francisco using such a protocol will allow the contrasting of written documents with objective archaeological data. Our multidisciplinary approach intends to bring light on some unanswered scientific questions about those particular moments of the European history, drawing a new way of seeing these soldiers, their anonymous death, and the construction of memory.

09 ARCHAEOLOGICAL TRACES OF THE SEPARATION OF BELGIUM OF THE NETHERLANDS IN 1831: REMAINS OF A PAINFUL PAST

Author(s): Schreurs, Jos - Doesburg, Jan - Kort, Jan-Willem (Cultural Heritage Agency of the Netherlands)

Presentation Format: Oral

The fact that in 1831 the Belgians separated themselves from the Netherlands has almost completely disappeared in the collective memory of the citizens in both Belgium and the Netherlands. The border that was drawn then is still the border between both countries. Although this event attains nowadays hardly any attention in the public debate it was then a very painful issue in the Netherlands. The young monarch William I lost a large part of his territory. This was not due to a military defeat but the result of a decision between the most powerful states in Western-Europa at the time. As a consequence of the separation military camps were installed on both sides of the new border. One of these camps on the Dutch side was located near Oirschot. Nowadays it is part of a military area and forested. For long almost nobody knew that there are still remains of this camp existing. Recent archaeological survey has shown that there are plenty of features of the camp, including several visual remains. The site has yielded several thousand of metal finds, clay pipes and fragments of pottery and glass. The features and finds illustrate the daily life in the military camp and the interaction with the local community. The archaeological information is complementary to that from written sources maps and

drawings. Oirschot is one of two archaeological sites from this remarkable event in Belgian-Dutch history in the Netherlands. In our opinion this site should be preserved for future generations. This is only possible if there is public support. Challenge for the future is to raise awareness among stake holders such as the Ministry of Defense, the municipality of Oirschot, the local inhabitants and the general public. This now unknown place can be transformed into a Lieu de Mémoire.

10 THE EFFECT OF COLONIAL MERCHANDISE IN THE BALTIC AREA DURING THE AGE OF ENLIGHTENMENT

Author(s): Alvik, Riikka (The Finnish Heritage Agency)

Presentation Format: Oral

After the foundation of St. Petersburg at 1703 the volume of merchant shipping increased dramatically at the Gulf of Finland. Before the technological innovation for breaking the ice, the shipping season was usually until April to October, sometimes even November even it was risky. Because of human error, lack of proper sea charts, storms etc. we have a remarkable number of well-preserved shipwrecks, which create an amazing source material together with written sources like toll records, salvage reports, newspapers and so on, which tell us about the changes in consuming habits in the northern Baltic.

Already during the late 16th century the Dutch and British merchants saw the possibilities of vast natural resources of Russia. New exotic colonial products like coffee, tea, tobacco, dyes, wine and fruit were transported to the harbours of the Baltic Sea during the 18th century and also new habits became more and more common, first among the upper classes of the society, but then spreading also to more modest homes. The most expensive dyes and clothing for allowed only for the upper class, but then there were also equal habits like smoking tobacco. These habits are nowadays a huge business, but how many of us is thinking the phenomena behind this – slavery, erosion, lack of land for cultivation of food. What is luxury then and how is the same product seen today? What if we would take a minute to think about these phenomena and research the present day situation: could we see the same patterns and perhaps learn something from them?

11 VESSELS OF TRANSITION: EXPLORING CULTURAL CHANGE THROUGH THE STUDY OF EVERYDAY POTTERY IN ULSTER POST-1500AD

Author(s): Carver, Naomi (Queen's University Belfast)

Presentation Format: Oral

Material culture can reveal rich information about its period of creation, use and beyond, and it can be interpreted in many ways. Material culture can show patterns of incorporation and rejection of new ideas and practices, or it can indicate where native transitions have ceased abruptly. Pottery is an especially fluent form of material culture. In Ireland, studies of pottery are often undertaken from an empirical stance. Furthermore, the existing literature highlights neglect of the lead-glazed coarse earthenware industry and only a handful of post-medieval kiln sites have been located. This paper, which is based on current PhD research, will adopt a multi-scalar approach, drawing on theoretical frameworks from various strands of historical archaeology debates. At a base level it will address a neglected pottery type, beginning with an overview of the evidence for the production and consumption of pottery in Ulster post-1500AD. Sixteenth-century Ulster had a flourishing native pottery industry, producing the hand-made, unglazed vessels known as 'everted rim ware'. The type is rarely found after about 1620, suggesting that the Plantation may have factored in its demise. Where everted rim ware is encountered in the later seventeenth century, at sites such as Salterstown and Movanager, County Derry, it is found alongside wheel-thrown, glazed wares, raising questions regarding this juxtaposition.

Analysis of evidence for changes in production (regional/temporal/technological) will be viewed considering questions about the broader impact of plantation and capitalism on Irish material traditions. The theoretically-informed interpretation of the empirical evidence will provide a deeper comprehension of the adoption and subsequent manufacture of new material culture by the native Irish. The paper will explore the significance of this before turning to answer wider questions on the conflict between identity and cultural change and how these answers may be employed to understand relevant modern situations e.g. Post-conflict Northern Ireland.

12 'THE BANE OF GOOD HOUSEWIFRY AND THE SOURCE OF IDLENESS' - IRISH IMPROVEMENT TEA-DRINKING FEARS VERSUS THE ARCHAEOLOGY OF PRACTICE

Author(s): Mytum, Harold (University of Liverpool)

Presentation Format: Oral

Food and drink offer important insights into the relationships between the body, material culture, and social relationships. Archaeological evidence in the form of ceramics has often been viewed in North America in terms of the 'tea ceremony', an elite form of socialisation in which women took a lead role within a domestic context. European archaeological study thus far has paid little consideration to the values associated with this activity, though 18th- and early 19th-century attitudes to tea and tea drinking were ambivalent. Improvement writers were greatly concerned that the Irish working class were being corrupted by the spread of tea drinking, it being associated with laziness, addiction, poor housekeeping and even political instability. Later in the 19th century social improvers shifted their position, with tea now an acceptable beverage extolled in opposition to the dangers of alcoholic drinks. This change of attitude led by the Temperance movement has coloured our understanding of the place of tea in the past. To what extent does the Irish archaeological evidence support documented claims regarding tea drinking across time, space and class, and, given the easy recognition of tea pots and tea wares, how can archaeologists further work to clarify the social and geographical

spread of tea drinking in Ireland?

13 INFLUENCE OF WATER AND MICROORGANISMS ON THE PRESERVATION STATUS OF TEMPLES IN POLAND

Author(s): Grupa, Dawid (Nicolaus Copernicus University; Department of Archaeology)

Presentation Format: Oral

At the turn of the 20th and 21st century, an intensive restoration of the historic sacred objects has begun in Poland. Thanks to the possibility of huge co-financing of conservation and renovation projects from EU funds, the possibilities of restoring the former splendor of many temples have increased. In recent years, many municipalities and parishes benefited from various financial aid, which otherwise could not afford to make the necessary conservation works. Unfortunately, in many cases, it turned out that the conservation works were insufficient and the appearance of new damages on the restored surfaces were observed. After a closer look at the problem, it turned out that only the walls of temples and paintings were subjected to conservation work, roof coverings were changed, rainwater and groundwater drainage systems were cleared, but the earthworks inside were forgotten. Due to the high costs of performed works, archaeological research was omitted. During the creation of projects and writing applications, no one took into account the dangers that could be found under the floor tiles of the churches. Within a few years, it turned out that it was an oversight that had a disastrous effect on the results of conservation works in those places. Dried brick walls have become the ideal target for the migration of water and microorganisms that have been trapped inside the burial crypts for years. The surfaces protected from the outside have been subjected to intense destructive factors from the inside. If at the same time it was decided to revitalize the surrounding green areas, flower beds, or even to level the area around the temples, the level of possible damage began to increase in proportion to the amount of soil covering the stone foundations of the churches.

14 A CONTEMPORARY ARCHAEOLOGY OF A CONTEMPORARY ARCHAEOLOGY OF THE CREDIT CRUNCH?

Author(s): Dixon, James (Wood)

Presentation Format: Oral

A decade ago I undertook a sustained period of research into the building of a new shopping centre in central Bristol, Cabot Circus, and the public art programme commissioned as part of the development. I placed this new build in the context of longer histories of regeneration efforts in the City of Bristol, going back to the Blitz, and of a century or so of changing conceptions of what public art means, and what and who it is for. What we didn't know when we started, me and the shopping centre, was that by the time it opened we would be in the midst of a global recession. Within weeks of the packed opening day, retailers had left and Cabot Circus was dotted with empty units. My research focused on the multiple, competing, simultaneous futures revealed by the public art scheme, but it was already clear by the time I finished the research that something else was happening as well. Could it have been foreseen by an archaeologist of art? How?

This paper will present the results of a re-visitation of that contemporary archaeological research. I want to talk about the archaeology of a ten year old shopping centre and its public art, but I will also address the issue of how that 2008 vision of the future looks so different from 2018 than it did then and why. Does this kind of reappraisal of the archaeology of the recent past have any implications for how we do contemporary archaeology in the first place? When we try to look at long-term processes, durations, trajectories, especially those that creep into the future, can we do anything more than describe the present?

15 GLOBAL RURALITIES DURING THE RECENT PAST. SOME ARCHAEOLOGICAL THOUGHTS

Author(s): Escribano-Ruiz, Sergio (University of the Basque Country - UPV/EHU; Grupo de Investigación en Patrimonio Construido, GPAC)

Presentation Format: Oral

The contribution of rural areas to the advent of globalization has not been sufficiently explored in historical perspective. There is both a growing geographical literature and a lack of studies drawing conclusions from the past. In this sense, our presentation aims to show the active way in which Basque rural areas participated in the shaping of colonialism and capitalism, and therefore in the process of globalization. This contribution is based mainly on the case of a farmstead that, even being on a hill, took an active part in two global and crucial processes. As a result, this example sets aside the pattern of rural self-sufficiency, placing the rural world at the epicenter of some of the most important historical processes that occurred in the recent past. On the one hand, producing cider for ships involved in colonialism and, on the other, providing nuts and iron ore for the development of the British Industrial revolution. In the end, our case study provides an example of a rural space that contributed to change the world and was transformed in the meantime, showing the centrality of an area that has been considered to be on the margins of any historical or archaeological narratives.

16 MATERIAL CULTURE STUDIES IN ANTARCTICA. UNDERSTANDING CAPITALISM IN AN EMPTY LANDSCAPE

Author(s): Senatore, Maria (CONICET-INAPL Universidad de Buenos Aires; Universidad Nacional de la Patagonia Austral; Investigadora Visitante Universidad de Alicante INAPH)

Presentation Format: Oral

The extreme isolation, hostile environment and the lack of human native population were factors that contributed to the understanding of Antarctica as a distant, inaccessible space empty of people and things. However, since its discovery in the early nineteenth century, European and other nations sent expeditions aimed at geographical exploration as well as commercial exploitation of its maritime resources. All of them were involved in the process of incorporation of a yet unknown and remote place in a global scale. The main goal of this paper is to show the analytical power that material culture studies have for understanding the connections that exploitation and exploration had in the past of Antarctica. Research projects on historical archaeology carried out during the last two decades have been studying whaling and sealing activities, examining the ways in which capitalism reached Antarctica. The significance of sealing and whaling expeditions and of the exploitation of natural resources has traditionally had low visibility in Antarctic narratives. The history of Antarctic continent has been understood predominantly as a sequence of extraordinary and unconnected events linked to expeditions motivated by scientific curiosity. Explorers' narratives and graphic documents have been traditionally used as the main sources of information. In this context, archaeological and material culture studies are contributing to diversify the ways of looking into and learning from the past, helping better understand the present and the future of human actions in Antarctica.

17 ELECTRIC VIRGINS: DOCUMENTING 20TH-CENTURY MARIAN SHRINES IN THE REPUBLIC OF IRELAND

Author(s): Campbell, Eve (Achill Archaeological Field School)

Presentation Format: Oral

The post-independence period saw significant attempts to 'decolonize' the Irish landscape. The process was most marked in urban centres where the symbolic landscape was reconfigured by the replacement of public monuments associated with the British Empire with more fitting effigies of Irish republican heroes. This paper focuses on a quieter but related monumental practice that occurred in the Republic of Ireland post-Independence: the erection of public Catholic shrines. These shrines, overwhelmingly dedicated to the Virgin Mary, are typically found in prominent roadside locations, in village centres, or in municipal housing developments. The shrines comprise large statues set in stone grottos, cases, or on plinths, often with flowerbeds and seating—many of them are illuminated at night. They date from throughout the 20th century, with notable peaks in the 1950s and 1980s—today some are abandoned while others remain sites of devotion.

On one hand, the shrines can be read as public declarations of Irish Catholic identity speaking to the close entwining of church and state in the new republic. They create an architecture of quotidian public prayer, and in their feminine subject of devotion articulate expected norms for Irish women. As such they have been places of contention and spectacle throughout the 20th century. In the 1980s as debates around the role of the Catholic Church in Irish society raged—often focusing on women's bodies—the shrines received renewed attention during a wave of reported apparitions at over 30 sites. Today they remain contested places in a state strongly influenced by Catholic ideologies but with an increasingly secular population. Based on a sample of 50 recorded sites, this paper gives an account of the monument type, exploring the social and political context of their creation, and what they articulate about changing identities in 20th-century Ireland.

18 TENEMENTS, CUL-DE-SACS AND COMMUNITY ACTION: RESIDENTS' RELATIONSHIPS WITH HOUSING OLD AND NEW IN VAUXHALL, LIVERPOOL, UK

Author(s): Dwyer, Emma (University of Leicester)

Presentation Format: Oral

From the city's community-led housing co-operatives and 'Homes for a Pound' to the Assemble architecture collective's Turner Prize-winning Granby Four Streets Project, Liverpool's contemporary approach to its housing and sense of place is shaped by the housing forms, government decisions, and urban decline and change of the last century. In Vauxhall, an inner-city district of Liverpool, the construction and demolition that has accompanied successive waves of 'slum' clearance during the 20th century have led to a palimpsest of older buildings among the very new - churches, canals, schools and pubs - by which residents orientate themselves, as well as attaching older values and significance to newer buildings. The reconstruction of Vauxhall has culminated in the latest manifestation of the area's amenities and working-class housing being shaped by residents themselves - a community-designed estate, the Eldonian Village.

This paper will examine the relationships that the residents of Vauxhall have had, and continue to have, with their evolving built environment, particularly as they have taken on greater responsibility for its success. The area's residents have simultaneously embraced and reacted against nostalgia, tradition, and history, and in doing so created a distinctive place in which to live and work during the last 35 years.

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Knight, Matthew (Later Prehistoric Finds Group) - Dietrich, Oliver (German Archaeological Institute, Orient Department)

Format: Regular session

It is widely accepted there was a greater movement of people and transmission of ideas and traditions in later prehistoric Europe (i.e. the Bronze and Iron Ages), as is increasingly evidenced by the most recent surge in scientific analyses, for instance of isotopes and DNA. The evidence provided by these techniques, however, can be enhanced by our main source material: portable material culture. Objects offer a physical representation of inherent concepts of form, manufacture skills and techniques, as well as the opportunities for material analyses to determine origins. Furthermore, the practices attributed to these objects, including the use, treatment, and deposition of objects can demonstrate how certain traditions transformed across different regions.

The aim of this session is to bring together a spread of case studies from across Europe during the Bronze and Iron Ages that enables insights into where and how regional and supra-regional links and networks were formed through the trade and exchange of materials and ideas.

We invite papers that look at traditions in the production, use and deposition of objects and how these may express influences and connections with other areas. This may include discussions around typologies and distribution patterns; production methods; origins of materials; depositional practices; and post-use treatments (e.g. reworking; fragmentation); as well as the impact these external influences had on the local communities.

ABSTRACTS

01 BRINGING CHANGE ACROSS THE BALTIC SEA IN THE 3RD MILLENNIUM BCE. REVEALING MOBILITY, EXCHANGE AND NETWORKS THROUGH POTTERY ANALYSIS

Author(s): Larsson, Asa (Swedish National Heritage Board) - Holmqvist, Elisabeth (University of Helsinki)

Presentation Format: Oral

In the 3rd millennium BCE, various Beaker cultures spread over much of Europe. Ancient DNA and isotope analyses have shown that population movements were a major contributing factor to these changes, establishing a foundation for the European Bronze Age networks. However, prehistoric organic remains are rare in many regions, making it difficult to pinpoint local and regional variations within the larger framework. Human mobility involves more than migration in order to resettle, with trade and exchange also being invaluable aspects of social interaction effecting change, both in terms of culture and technology. These processes have to be traced in the material objects rather than the human remains. We present a study of Corded Ware pottery from Finland, Estonia and Sweden, both from a craft standpoint (operational sequence) and through SEM EDS and PIXE analysis on clay properties and geochemistry. The ceramic compositional data from the SEM-EDS analysis reveal eight geochemical clusters, at least five of which appear to be associated with specific find locations and regional craft traditions. The results show complex inter-site and cross-Baltic Sea pottery exchange patterns that probably result both from resettlement and exchange. The long-term patterns of contact and mobility became more defined by analyzing the grog temper as well, i.e. previous generations of pots that were repurposed to make the new beakers.

The study of material culture is as important as the study of human remains if we want to understand the complex processes of change in cultures and populations in prehistory. It is a necessary complement that works both on the individual level (craft), as on the regional and super regional level: mobility of people and/or exchange of knowledge and objects.

02 OUT OF IBERIA: IRISH PREHISTORIC METALWORKING EXPERTISE ORIGINATED IN SPAIN AND SPREAD TO BRITAIN

Author(s): Bell, David (Queen's University Belfast)

Presentation Format: Oral

The history of Ireland is one of conflict, transition and change as successive waves of migrants introduced novel technologies and traditions to Europe's most westerly outpost. Indeed, the Leabhar Gabhála, or Book of Invasions, compiled by medieval scholars who synthesise eastern biblical texts and local oral traditions, captures one of Ireland's most comprehensive origin legends. This charts the arrival of first the Partholóns, followed by the Nemedians, the Fir Bolgs, the Tuatha Dé Danann and finally the Milesians, the warrior sons of the king of Spain. Older Welsh writings contend that all of the groups who settled Ireland had originated in Spain, a theme echoed down the years by a number of Iberian authorities.

Despite its persistence, and the support of several influential archaeologists during the first half of the twentieth century, the case for an 'out of Iberia' origin for the Irish was eventually lost. It is now generally agreed that the various peoples who settled this island in prehistory most probably did so by crossing the Irish Sea from Britain. This is sustained by the hypothesis that certain aspects of Irish material culture, particularly metal weaponry from the Beaker period and Early Bronze Age, were subject to strong British

stylistic influences.

Recent genetic analyses, however, have revitalised the argument for a more diverse provenance for the Irish, including a strong Iberian component. This is now complemented by a re-evaluation of British and Irish copper alloy daggers and halberds, the earliest metal-bladed weapons. Trackable changes to depositional practices clearly attest to a more significant flow of influences from Ulster through Scotland to northern England than vice versa. It is further argued that while British Beaker traditions may have been rooted in central Europe, the evidence from Ireland now points firmly to northern Iberian origins.

03 SCOTTISH BRONZE AGE FOOD VESSEL CORPUS - SCALES OF ASSEMBLAGE AND REFERENTIALITY

Author(s): Innes, Marta (University of Glasgow)

Presentation Format: Oral

Within the study of the British Bronze Age pottery class of Food Vessels (2140-1620 BC), the main trend in the conceptualisation of the pots has generally been limited to a discussion of most apparent ceramic attributes, their translation to broadly regional categories, and potential for supplying broad socio-cultural and symbolic implications. This focus on categorisation effectively splits the Food Vessel class into questionable types and defines the vessels in opposition to other prehistoric ceramics, rather than providing the platform for appreciation of the links and interactions between different 'traditions'. This paper proposes an alternative approach to the analysis of Food Vessel pottery, following the implications of assemblage theory to conceptualise the pots as collective material beings and the ceramic corpus as an inter- and intra-referential assemblage; situating both within the broader relational continuum of networks of referentiality and citational and indexical fields - where each assemblage effectively refers to, draws on, recalls and transforms elements of past and existing assemblages. By moving beyond the focus on categorisation and concentrating instead on the relational and referential perspectives of the creative process of assemblage making, it is then possible to demonstrate the influences and connections between different ceramic 'traditions', and investigate the scale and extent of the regional and chronological links, both specifically within the Food Vessel class and within the wider assemblage of British Bronze Age ceramics. Acknowledging the networks of interactions, references and citations, allows us to explore the transmission and exchange of ideas and to appreciate how a shared creative repertoire was manifesting itself throughout prehistoric Scotland and Britain.

04 LOCAL PRACTICES AND NON-LOCAL INFLUENCES: MIDDLE BRONZE AGE SETTLEMENT POTTERY AND INTRAREGIONAL CONNECTIONS IN THE CARPATHIAN BASIN

Author(s): Staniuk, Robert (Graduate School 'Human Development in Landscapes' at Kiel University)

Presentation Format: Oral

Transmission of ideas in Middle Bronze Age Carpathian Basin is interpreted in a latitudinal manner, focusing on spectacular finds associated with long-distance exchange networks. The reason behind this research orientation is, at least, twofold: 1) well-developed typo-chronologies of bronze objects provide sufficient basis for interregional comparison; 2) evidence of intraregional exchange is obscured by countless ceramic typologies, which devoid of contextual data limit research to investigating boundaries between stylistically-recognized units. The consequence of this situation is this: on the one hand, the communities of the Carpathian Basin are in constant connection with Northern and Mediterranean Europe; on the other hand, it is unclear how they interact with each other.

The presented paper concerns interaction within the Carpathian Basin on the basis of the ceramic assemblage recovered during excavations in Kakucs-Turján mögött - a multi-layered Middle Bronze Age settlement in Central Hungary. The collected data addresses the problem of production and co-existence of ceramic styles in a diachronic perspective with an emphasis of recognizing local practices instead of long-distance patterns.

The results will focus on the typological investigation of the collected assemblage, supplemented by contextualization of the finds. By investigating the settlement context it is possible to identify and study the everyday practices and their implications for structuration of the community. As a result, it is possible to not only confirm the presence of the outside influences but to investigate the responses and preferences towards them.

05 CRAFTS DURING THE BRONZE AGE: POTTERY TECHNOLOGY IN SAN ADRIAN (GIPUZKOA, NORTH OF SPAIN)

Author(s): Quevedo-Semperena, Izaro (Sociedad de Ciencias Aranzadi) - Cubas, Miriam (Sociedad de Ciencias Aranzadi; BioArCh. University of York) - Tapia Sargana, Jesus (Sociedad de Ciencias Aranzadi) - Armendáriz Gutiérrez, Ángel (University of Cantabria; Instituto Internacional de Investigaciones Prehistóricas de Cantabria) - Arrizabalaga Valbuena, Álvaro (Universidad del País Vasco) - Ceberio Rodríguez, Manuel - Moraza Barea, Alfredo (Sociedad de Ciencias Aranzadi)

Presentation Format: Oral

The Bronze Age in Europe implied many economical and social changes, probably related with an increase of the social inequality that may be explored in the archaeological record. In the Cantabrian region (North of the Iberian Peninsula), the research of the Bronze Age have been traditionally focused on prestige goods and funerary contexts. To address the study of the period, most of the information comes from caves, megalithic structures and isolated bronze findings. Therefore, the lack of information about daily activities, subsistence strategies, and human settlement on a regional background is evident.

In this presentation we contribute to the reconstruction of the social dynamics and structure of the communities during the Bronze Age through the analysis of the pottery assemblage recorded in San Adrian. The mineralogical analysis in thin section of 46 samples has revealed important aspects related to the raw materials procurement and manufacturing techniques.

The data suggest that the raw materials used in pottery manufacture were available in the surroundings, which allows us to propose a local technology, probably elaborated near the settlement. In addition, different sources were used in the manufacturing of the vessels, as well as different ways to prepare the clay. The identification of several tempers suggests different pottery-making practices during the Bronze in the North of Spain.

06 BETWEEN EUROPE AND THE NEAR EAST: BALANCE WEIGHTS AND WEIGHING IN LATE BRONZE AGE CYPRUS

Author(s): Siennicka, Malgorzata (University of Göttingen, Institute of Archaeology)

Presentation Format: Oral

Although the island of Cyprus seems to have remained largely isolated throughout the earlier phases of the Bronze Age, during the later 2nd millennium BCE it became a significant trade spot in the maritime networks of the East Mediterranean. Because of the considerable intensification of copper production and export during the Late Cypriote period, the island greatly increased its external contacts and transformed into the important trade partner of Egypt, Levant, Anatolia and the Aegean. As active participants in international trade, especially in the export of copper, the merchants from Cyprus most probably adapted existing metrological systems from other areas. Balance weights have come to light at numerous Late Bronze Age sites on Cyprus in various contexts: in settlements (e.g. Hala Sultan Tekke; Apliki-Karamallos), in graves (e.g. Hala Sultan Tekke; Ayia Irini-Paleokastro; Paleokastro by Ayia Irini) and in hoards (e.g. Kalavassos-Ayios Dhimitrios; Enkomi; Pyla-Kokkinokremos). The primary aim of this paper is to review the weighing equipment (balance weights and scales), as well as metrological systems used on Cyprus in the Late Bronze Age. It seems that only Egyptian and Near Eastern metrological systems were adapted, while the Aegean system was not applied. This is especially striking since wide trade and social contacts with the Aegean had existed for many centuries and became particularly intensive in the Late Bronze Age. In addition, the relationship between metal production and weighing utensils, including both canonical and uncanonical weights (potential stone weights), will be investigated.

07 MIXING IT UP: LATE BRONZE AGE MIXED ORIGINS HOARDS FROM SOUTH WEST ENGLAND

Author(s): Knight, Matthew (Later Prehistoric Finds Group)

Presentation Format: Oral

The Late Bronze Age is a period during which large volumes of metalwork was deposited in hoards. Traditionally, these have been interpreted as the accumulation of scrap or the disposal of waste, though increasingly these theories are found to be inadequate. This paper will show that a closer analysis of hoards can demonstrate the broad influence of different areas on individual practices. By studying the Late Bronze Age hoards from south-western England, it is possible to illustrate how different practices were undertaken in various parts of this region. This was influenced by the geographic positioning of the south-western peninsula and its proximity to different areas, as well as the available materials and the movement of people. For instance, different hoards from the South West show influence from France, Ireland and Wales at different times, which is evidenced through the objects that were accumulated and deposited. The mixed origins of the objects and hoards suggests that a variety of exchange networks were in place for both objects and ideas and that there was no widely understood practice for how one should treat and deposit objects in this region. Overall, this paper supports the notion that all-encompassing definitions for hoards are no longer applicable.

08 AN AMBER NECKLACE: THE LATE BRONZE AGE RITUAL DEPOSIT OF CABECINHO DA CAPITÔA (MAFRA, PORTUGAL)

Author(s): Sousa, Ana Catarina - Pereira, Carlos (UNIARQ, Center for Archaeology of the University of Lisbon) - Odriozola, Carlos (Department of Prehistory and Archaeology, University of Seville) - Monge Soares, António (Centro de Ciências e Tecnologias Nucleares - C2TN, Instituto Superior Técnico, Universidade de Lisboa) - Miranda, Marta (Câmara Municipal de Mafra) - Arruda, Ana Margarida (UNIARQ, Center for Archaeology of the University of Lisbon)

Presentation Format: Oral

In pre- and proto-historic contexts, the classification of a deposit as ritual is always debatable resulting from a theoretical positioning and the quality of the field documentation.

Cabecinho da Capitôa (Mafra, Lisbon) is an excellent case study to address this issue. The site, located on a small hill, was fully excavated in 2006 as part of a preventive archaeological intervention. The extensive fieldwork recorded two main areas with preserved contexts: a fireplace and a pit with fragmented ceramics in situ (NMI 236 containers) as well as an amber necklace consisting of 44 beads. Besides those contexts, no evidence of an effective occupation was found and the presence of organic matter was neither recorded.

The fragmented ceramics and the amber necklace correspond to offerings of very different meanings. It should be noted that this Cabecinho da Capitôa necklace is exceptional in the Portuguese panorama, as it is the only complete necklace and the most numerous LBA set of amber beads in connection (it must be noted that the total number of findings of amber artefacts in Portuguese LBA

is less than 10). The radiocarbon dating corroborates this chrono-cultural integration of the described contexts. The beads analysis points to a Baltic origin, as it has been proposed for contexts of identical chronology.

The meanings of ritual deposits, as exogenous to or integrating realities in the social networks of LBA societies in Western Iberian Peninsula, will be discussed.

09 ARMORICAN SOCKETED AXES – COMMODITIES FOR HOARDING AND EXPORT DURING THE LATE BRONZE AGE/EARLY IRON AGE?

Author(s): Dietrich, Oliver (Deutsches Archäologisches Institut)

Presentation Format: Oral

Armorican axes form the backbone of Late Bronze Age / Early Iron Age hoards in Brittany and Normandy, and they circulated widely in northwestern Europe in prehistory. Finds have also been published from Central and Eastern Europe, but many of them come with a big question mark regarding their authenticity. Following the big discoveries in France, Armorican axes were widely distributed as gifts between researchers or through the art market especially in the late 19th and early 20th century. Many were associated with fictional find spots to increase their value. A number of pieces so far considered to be authentic finds and used as evidence for supra-regional contacts can be suspected to be modern imports. It is thus necessary to look at all available information regarding find circumstances closely to determine the 'real' prehistoric distribution of Armorican axes.

It seems that only for Polonia and Bohemia there are finds which could be the result of Early Iron Age contacts, although questions remain also for these regions, as there do not seem to be finds discovered after 1950. Against this background, the probability and mode of Early Iron Age contacts between western and eastern Europe will be analyzed critically in this paper.

10 CULTURAL EXCHANGE IN IRON AGE THRACE: AN ANALYSIS OF EXTERNAL INFLUENCES THROUGH TRANSFORMATIONS IN CERAMIC MANUFACTURING

Author(s): Hart, Ashlee (University at Buffalo, SUNY)

Presentation Format: Oral

For thousands of years diverse cultural groups occupied, and interacted, in the region of ancient Thrace, mainly located in the modern country of Bulgaria. The results of these interactions are revealed in the adoption of foreign materials, products, and technological achievements first accomplished in surrounding regions. The locally made Thracian ceramics from the Iron Age present a case study for the identification and evaluation of outside influence in the region. The Iron Age ceramics have been relatively understudied, which allows this paper to present the latest identifiable changes in the manufacture and consumption of ceramics from Iron Age Thrace. This paper briefly presents a typology of ceramics from the Early Iron Age (1,200 – 900 B.C.E.) and Late Iron Age (900 – 200 B.C.E.), which reveal changes in manufacturing technique, decoration, and vessel form. These changes can be revealed through visual inspection and are considered larger scale changes while smaller changes, such as the clay makeup and preparation, are subsequently analyzed through archaeometric testing. The combination of these methodologies presents change and consistencies as something comparable to broader associations within Thracian society. These changes will then be compared to previous and current thoughts about outside cultural interaction in Thrace throughout the Iron Age. (201)

11 NEW INSIGHTS ON THE LATE HALLSTATT CULTURAL CONNEXIONS REVEALED BY THE GRAVE GOODS FROM VALEA STÂNII NECROPOLIS (FERIGILE GROUP, ROMANIA)

Author(s): Mandescu, Dragos (Arges County Museum)

Presentation Format: Oral

Traditionally, mainly due to the results of the field researches conducted in the '60s-'80s of the last century, the Early Iron Age archaeological group Ferigile was considered as a secluded cultural entity, having a pregnant local and conservative expression of the material culture in the territory south of Carpathians during 7th-5th centuries BC. Few supra-regional elements like akinakes swords or Saltaleone type adornments found in some of the group's graves hardly counterbalance a uniform image dominated, for instance, by hand modelled pottery in standardized shapes and decorations, the exclusive preference for a peculiar type of arrowhead and the scarcity of using the fibula. Recent excavations of the necropolises of this period, albeit increasingly rare and restricted in Romania, have the potential to bring about a certain change of perspective upon this archaeological group. The incineration necropolis from Valea Stâinii (Argeş county) is the most recent archaeologically explored cemetery belonging to the Late Hallstatt Ferigile group. Some of the assemblages found in the graves during the 2014-2017 archaeological seasons reveal many items used as grave goods but of an apparently non-local origin, both in the weapons domain (arrowheads), as well as in the adornments repertory (beads, status and prestige items) or even in the pottery forms. These types of "foreign" elements occurring for the very first time in a Ferigile necropolis sheds new light on the cultural milieu of this archaeological group, certifying it as an acting entity, active part of a North Balkans network of exchanges and influences received both from East and West.

12 FINDS OF HISPANIC COINS FROM THE EASTERN ADRIATIC AND ITS HINTERLAND

Author(s): Celhar, Martina - Ilkić, Mato (University of Zadar)

Presentation Format: Oral

During the Late Iron Age money was gradually accepted as a means of payment on the eastern Adriatic coast and its deeper hinterland. However coin types that circulated in this region are not equally represented. Liburnia and neighbouring Iapodea stand out as they are characterized by identical or very similar monetary scheme, particularly in the last three centuries BC. Namely coins from very distant regions circulated in Liburnia and Iapodea, that are exceptionally rarely found in the nearby areas. Mostly these are coins from Carthage and Numidia, and also Ptolemaic coinage. Adequate scientific explanation of this phenomenon has not been provided as yet. In addition to these north African coins, currencies from western Mediterranean also reached Liburnia and Iapodea. These are coins from Hispania, mostly unpublished. The biggest number (19 pieces) originates from the city of Castulo. They were found at ten sites: four in Liburnia and six in Iapodea. Two coins from the city of Obulco were also found in the Iapodean region as well as one specimen from Emporion. Finds of coins from Hispania are very scarce in the region south of Liburnia. Only one example was found in central Dalmatia, in Resnik near Split – a coin from Celsa. Some place on the eastern Adriatic coast, probably Zadar, was a findspot of another Hispanic coin, this time from Segobriga.

13 ROMAN OR BRITON? IMAGES OF THE ICENI AS DEPICTED ON THEIR COINS

Author(s): Chadburn, Amanda (University of Bristol)

Presentation Format: Oral

The Iceni – a late Iron Age people in the northern part of East Anglia, England – are famous for their rebellion in AD61 against Roman rule, led by their female war-leader Boudica following the death of her husband, King Prasutagus. Although famed for their rebellion, numismatic evidence suggests they were pro-Roman for many years, and ally of Rome for around a century. They used coins from at least the first century BC onwards, and minted their own from around 60BC to around the Roman Conquest of AD43 – and perhaps beyond that date as a privileged Client Kingdom.

The images on these Iron Age coins vary from “Celtic” designs of wolves, horses, boars, stars and crescents, to some late designs which appear more Romanised, sometimes depicting portraits and – for the very first time in this region - writing. Additionally, as a non-metal producing area, the Iceni must have established networks (trade? political?) which allowed them to acquire many kilos of precious metal to allow them to mint their extensive coinages.

Based on doctoral research, this paper explores the changes in these Icenian coins over this hundred year period, and what this tells us about the external influences on the Iceni, and their connections with other parts of Britain and Europe.

a. AN EXPERIMENT, A SOLUTION OR A FAIL? THE CASE OF POTTERY KILNS FROM STRZELCE MAŁE (MAŁOPOLSKA PROVINCE, POLAND)

Author(s): Bulas, Jan - Okońska, Magdalena (Jagiellonian University) - Przybyła, Marcin M. (Independent researcher)

Presentation Format: Poster

The production of the wheel made pottery spread in the Przeworsk culture during the younger Roman period. Beside of well-known production settlements located on the left bank of the Wisła river, there is also settlement zone located on the right bank of lower Raba river. The pottery production in this region is represented by the sites on which numerous kilns were unearthed. One of those sites was the settlement in Strzelce Małe.

Three out of five kilns discovered during the excavations in Strzelce Małe had untypical construction, in comparison with the known examples from the other Przeworsk culture sites. The most puzzling one is a kiln with rectangular shape, with presumable a space for a bellows. The kilns with similar shape are not found in the Barbaricum, but only on the territory of the Roman provinces. The question is what was the reason for the use of this technological solution, as well as other unusual examples of kiln constructions discovered on the site? Was it a difficult raw clay material which needed a higher burning temperatures than elsewhere? Is it a proof for high skills and knowledge of the local potters? Maybe it was a way to dissolve some technological problems? Did the potters work haphazardly or were they able to predict the consequences of their choices? All of these questions cannot be currently unambiguously answered, however the case of pottery kilns from Strzelce Małe enable us to reflect on the skills of the potters and their flexibility. Additionally the magnetic survey conducted on the site confirmed that there are other kilns. It shed a new light on the subject of space organisation of that kind of production sites.

THE “GEOSPATIAL TURN”: CRITICAL APPROACHES TO GEOSPATIAL TECHNOLOGIES IN ARCHAEOLOGICAL RESEARCH

Theme: Theories and methods in archaeological sciences

Organisers: Kalayci, Tuna (CNR-IBAM) - Seifried, Rebecca (IMS-FORTH)

Format: Session with presentations of 6 slides in 6 minute

The use of geospatial technologies in archaeological research has reached unprecedented levels. GPS-enabled smartphones, online viewing platforms for high-resolution satellite imagery, cheaper and lighter drones, and click-and-go photogrammetry software have dramatically and irreversibly changed archaeological practice. Today, an archaeological project without a GIS element is considered ill-defined. Google Earth is as essential to field surveys as geophysical prospection is to an excavation. The “spatial turn” that revolutionized the humanities in the 1980s is being reinforced once again, this time with a digital twist that encompasses a range of geospatial technologies including GIS, remotely-sensed imagery, geophysical survey, and 3D visualization.

We invite researchers to contribute ideas on the praxis of geospatial technologies in archaeology and to critically assess how these technologies are being used today. These ideas may be built around the set of questions: What are the current and future impacts of the use of geospatial technologies on marginalized perspectives of archaeology (e.g. feminist or indigenous archaeologies)? Are these technologies succeeding in bridging theoretical gaps within archaeology, or are their capabilities limited by the ongoing geospatial revolution in other (non-) academic circles? What are the implicit and explicit implications of using proprietary geospatial software and corporate- or military-derived technology in academic research? What are the implications of the regulatory nature of geospatial methodologies (i.e. workflows that have been regulated and/or optimized by “best practices” or by specific groups, organizations, or corporations)? How do the “big data” paradigm and the “slow archaeology” movement conflict and/or intersect?

ABSTRACTS

01 ARCHAEOLOGY AND THE MILITARY COMPLEX

Author(s): Kalayci, Tuna (CNR-IBAM)

Presentation Format: Oral

The relationship between archaeology/anthropology and the military has always been complex; one might even argue that the very practice of archaeology was founded with imperial interests and, thus, is inherently colonialist in nature. Modern-day institutional efforts, such as the U.S. Army Training and Doctrine Command (TRADOC) and Human Terrain System (HTS), the U.S. Committee of the Blue Shield, and the ASOR Cultural Heritage Initiatives (CHI): Safeguarding the Heritage of the Near East Initiative, further cascade these two praxes: ad hoc academic groups are mobilized in order to win a war or protect material culture during times of conflict.

On the other hand, archaeologists have enthusiastically embraced – with or without reflexivity – military applications and geospatial technologies like satellite sensors or drones. In today’s rapidly arming world, the questioning of whether the knife is being used “as a tool or as a weapon” is increasingly unproductive. Instead, archaeologists should embrace the ethical responsibility to go beyond the rhetorical situation; to date, there have been few public statements from archaeologists in support of (or against) the wars of the 21st century.

This purposefully tendentious stance intends to turn a spotlight on the militarization of archaeology and the ways in which archaeological practice might be legitimizing warfare and providing a humanitarian facade for the military complex. As a countermeasure, increased functional, critical, and rhetorical literacy is proposed.

02 ARCHAEOLOGICAL SURVEY AND THE ETHICS OF (UN)INTENTIONAL SURVEILLANCE

Author(s): Seifried, Rebecca (Institute for Mediterranean Studies - FORTH)

Presentation Format: Oral

Remotely-sensed images are an essential part of the archaeological surveyor’s toolkit. Where survey teams once relied on military topographic maps or (low-resolution) historical aerial photos to get a sense of an area’s topography before beginning fieldwalking, the advent of accessible and affordable remotely-sensed imagery allowed them to print pre-designed maps and take them into the field, or load them onto tablets and smartphones to guide fieldwalking in real time.

While high-resolution images taken with planes and commercial satellites are undoubtedly better-suited to the needs of archaeological survey, the very act of possessing these images – as well as purchasing, analyzing, printing, and disseminating them – implicates survey archaeologists in an (un)intentional surveillance of the people who live in the landscapes they are attempting to document. Thanks to continual updates to Google Earth’s image inventory, for example, archaeologists can track how tiny portions of the landscape have changed: in some cases, they can even pinpoint the very moment when an access road is paved, an individual religious shrine is destroyed, or a house is abandoned.

As a group, archaeologists have yet to acknowledge – let alone tackle – this ethical quandary. Unlike the guidelines endorsed by professional RS or GIS groups, the EAA and the SAA codes of ethics fail to mention ethical issues that should be considered when using

remotely-sensed imagery. Other archaeologists (e.g. Parcak 2009) have focused attention on the ethics of site discovery and the protection of cultural heritage, rather than the privacy of the people being (un)intentionally surveilled. This presentation challenges us to consider the ethical implications of such high-resolution research, and to identify practical steps that survey projects can take to protect the data they gather about people living in and around the landscapes they study.

03 REMOTE-SENSING AS PUBLIC OUTREACH: PROVIDING A HISTORICAL PERSPECTIVE ON THE ENVIRONMENTAL IMPACTS OF EVERYDAY LIFE

Author(s): Stelson, Laura - Triozzi, Nicholas - Druggan, Patrick (The Pennsylvania State University)

Presentation Format: Oral

The application of geospatial technologies to archaeological research opens up new methods of gathering, structuring, querying and disseminating data which were never possible before. Our discussion emphasizes the utility of fine-grained topographic and remote-sensing data such as LiDAR, aerial photogrammetry, and infrared capture for identifying small-scale anthropogenic impacts across large geographic extents. While initially prohibitively expensive, increasing development of these technologies outside of the private sector has made their use substantially more affordable, further expanding their potential for archaeological research to a wider range of institutions and communities. The ability to identify and quantify subtle landscape modifications highlights the contributions of even the most marginalized members of society in generating a permanent imprint on their surroundings. This use of geospatial techniques to demonstrate the cumulative environmental footprint of ancient settlements may offer broader audiences important insight into the enduring impacts of their own actions and their implications for landscapes of the future. We advocate for thoughtful use of geospatial approaches and highlight the contributions of several recent studies from around the world in a consideration the intersection between the work done on quantifying the extensive impacts of past indigenous populations on landscapes and its reception and circulation by mainstream media outlets. In evaluating the potential broader impacts of remote-sensing in archaeology, we focus on aspects of this research that generate public attention and the efficacy of communicating findings - it is our hope that the human interest captured by such studies may be used as a catalyst for generating public policy and social change.

04 A PARADIGM OF ARCHAEOLOGICAL AMATEUR 'RESEARCH' - DETECTORISTS TAKING TO THE AIR... AND SOCIAL MEDIA

Author(s): Broch, Mathias (De Kulturhistoriske Museer i Holstebro kommune; University of Copenhagen)

Presentation Format: Oral

The Danish law on use of metal detectors is in many ways liberal, and thousands spend their leisure time surveying more or less systematically. As an unwritten code amongst the Danish detectorists, it is strongly discouraged to survey areas other detectorists currently occupy. These unofficial codes of conduct has been heatedly discussed in the community, as the hobby seems to increase in popularity, and is continually enforced through bans and smearing of individuals. As such, an encouragement to locate new sites of archaeological interest is always strong in these communities. Thus, the adoption of geospatial technologies as LiDAR and aerial photography in amateur circles has also increased during the last decade.

This amateur paradigm in aerial archaeology is still in its infancy, but already problems seem to arise - especially along lines of a lack of basic archaeological knowledge, misinterpretations, self-promotion on social media, appropriation of survey rights to large areas and perhaps even disseminating of 'fake news'. On the contrary, when new sites are accompanied with reasonable interpretations, the fear of sites being compromised by other detectorists results in secrecy. Even when the sites are shared with professionals, many Danish archaeologists do not place much credence in aerially obtained data, and valuable information is thus reduced or dismissed. The current situation is not ideal, and the tendency toward amateur 'research' continues to pick up momentum.

In this paper, I will present and discuss the issues concerning the aforementioned tendencies amongst Danish detectorists, and attempt to clarify the implications this has for both research and heritage management. I hope that this will open up a discussion on how similar issues are handled around Europe.

05 REMOTE SENSING APPLIED TO THE HISTORICAL STUDY OF THE CULTURAL LANDSCAPE OF SIERRA NEVADA (GRANADA - SPAIN)

Author(s): Romero Pellitero, Pablo (University of Granada)

Presentation Format: Oral

This presentation is focused on new techniques in the analysis and survey on Landscape Archaeology through the information and techniques offered by Remote Sensing, based on the use of orthophotos, satellite images, LiDAR data and GIS. This work is enhanced with local communities collaboration.

The study of historical agrarian landscapes in mountainous areas such as Sierra Nevada (Granada-Spain), present the complication of large unlevel terrain and its hiding by invasive shrub vegetation and reforestation in the second half of 20th century.

The identification of anthropic characteristics and structures of the agropastoral historical system supposes an exhaustive field-work of survey that is helped by the use of remote sensing techniques and tools, with special attention to the LiDAR data, for the identification of historical aquifer recharge systems, old irrigated areas, grazing areas, communication routes and potential sites still unknown. We will share the problems that come with their location caused by their variability of typologies, their scarce imprint

on the land, their materiality, etc.

This research was started in the framework of the European FP7 MEMOLA project, which aimed to research the historical formation process of the cultural landscape in relation to the use of natural resources, especially water and soil. Its purpose was not only to detect and study cultural landscapes, but to raise awareness and promote its revival as productive historical spaces as well as to support the local communities that manage them.

06 SPATIAL ANALYSES AND SETTLEMENT STUDIES: VERIFICATION OF EXISTING SCHEMES

Author(s): Niedziółka, Kamil (Institute of Archaeology, Cardinal Stefan Wyszyński University in Warsaw)

Presentation Format: Oral

This contribution will be based on the results of settlement studies conducted for the region of Eastern Pomerania (Northern Poland) during the turn of the Late Bronze and Early Iron Age. This period is linked with significant changes among local material culture as well as with important transformations in settlement structure. However, despite the existence of extensive subject literature, there was no meaningful emphasis on the settlement studies. This situation led to many hypotheses concerning that question which were developed without solid methodological background. They were based mainly on archaeologist intuitive assumptions or simple analyses of maps presenting dispersion of materials from given chronological phase. Introduction of GIS as well as utilisation of spatial analyses based on comprehensive dataset gave the opportunity to verify most of these suppositions. What is more, they also allow to make further observations going beyond the current state of knowledge which is still based on the traditional culture-history paradigm.

The aim of this paper will be presentation of the final remarks of conducted spatial analyses. Their results show how deceptive current settlement studies can be. According to acquired results, contemporary state of archaeological recognition, still treated by many archaeologists as a straight reflection of the past settlement structures, is determined by many factors. Determinants of the location of prehistoric settlement, i.e. factors existing in the analysed past, were only one of them. There are also quite contemporary ones, linked e.g. with wood cover, the course of large investments, activity of past and modern archaeologist or shape of current settlement. Therefore utilisation of spatial analyses, with the fundamental help of GIS, may allow to create a kind of a critical workflow useful while preparing data for proper settlement analyses. Besides that, completed activities let us look at spatial analyses from a different perspective than before.

07 MODERN APPLICATION AND SCIENTIFIC RESEARCH. TARGȘORU VECHI CASE

Author(s): Magureanu, Andrei (Institute of Archaeology) - Ciuperca, Bogdan - Penes, Marinela - Anton, Alin (Prahova County Museum of History and Archaeology)

Presentation Format: Oral

Geographic information system plus Google Earth plus geophysical survey plus 3D archaeological recording of excavations are components of a so-called modern archaeological analyses. You don't have those, then you are not doing a modern research. There are used in archaeological research trying to supply the data either before the excavation, either after excavation. But those applications are more than a better-looking manipulation of data? There is not a trap for archaeologist enchanted by the colors and organized data into a Geographic information system?

Our discussion, above the implication in academic research have the starting point in a set of geophysical (geomagnetic data, electrical resistance survey data), airborne (aerial-photography, LIDAR - laser scanning), landscape and excavation data, that we have from a studied area covering all the main epochs, from Neolithic till Modern Times, in Târgșoru Vechi area (Prahova County, Romania).

Using this kind of data is, still, a pretty new method of investigate the past in Romanian archaeology, both in practice and theory, and their fully implication into a scientific approach has not been studied. We imported the methods and applied in our studies but we are far away from establishing a code of "best practices" that to allow us to combine the best from new methods with the best from old ones.

08 ARCHAEOLOGY WITHOUT EXCAVATION?: LASER SCANNING IN OSTIA

Author(s): Ogawa, Takuro - Hori, Yoshiki (Kyushu University)

Presentation Format: Oral

Archaeologists who specialize in excavating generally do not show much interest in sites unearthed by others, and prefer to focus their research on remains discovered by themselves. A detailed analysis is made of all the records of its archaeological remains, on the other hand those records could be filtered or selected by the archaeologists depending on their interests.

Laser scanner, which can collect the three dimensional data automatically of the surface of the objects, is almost free from those filtering and selection. Measured three dimensional data, which is usually called point cloud, is aligned and assembled a cluster based on shape features of the objects. Point cloud also can follow the world coordinates system by using a GNSS device, so we are able to precisely align and construct three dimensional big data of whole of a ruin with almost no error.

Japanese team has carried on laser scanning and constructed big data which is point cloud of whole of Ostia since 2008. In this project, we install GPS points all over the ruins and measure in a manner of triangulation by using laser scanner. Eventually we will make detail drawings with tracing the orthographic projection of three dimensional data of Ostia. Arbitrariness will almost disappear

because of measuring overall the ruin by using geospatial technology. It is effective to be updated and corrected even with slight misalignments of previous drawings because of axis or thickness of walls in archaeology, especially history of architecture. This inconspicuous gives us some chances to launch researches focusing on slight shape of buildings.

09 SLOW SPACES: BIG DATA, SMALL DATA, AND THE HUMAN SCALE

Author(s): Caraher, William (University of North Dakota)

Presentation Format: Oral

Fernando Braudel famously demonstrated in *The Mediterranean World in the Age of Philip II*, that historical data analyzed at various scales are not necessarily comparable or commensurate. In other words, history written at the chronological and spatial scale of the *longue durée* need not inform history written at the scale of the individual or event. On the one hand, this appears to be a common sense conclusion and corresponds well to our experience of purchasing suggestions produced by algorithm, the music choices of Pandora, or any number of predictive models that falter when ground-truthed.

On the other hand, archaeologists regularly seek to work between scales as they both collect information in the field in a tremendously granular and detailed way and seek to use so-called "big data" to understand lived experiences. To make data collected at the small scale commensurate with both data and research questions articulated at a larger scale invariably involves standardization practices that obscure the agency of the individual archaeologist. In this way, our sense of scale in argument influences, in some ways, the limits of agency in practice.

My paper today will briefly explore the intersection of slow archaeology and space in archaeology. Slow archaeology offers a critical approach to digital practices in field archaeology and emphasizes the irregular and unstructured nature of archaeological knowledge generated through experience. These slow spaces represent a distinct form of archaeological knowledge making because of their incommensurability with the spaces of big data. These are not space that can or should be reconciled with the conventional approaches of spatial analysis.

10 CLOSING THE LOOP ON THE GEOSPATIAL TURN IN ARCHAEOLOGY

Author(s): Newhard, James (College of Charleston)

Presentation Format: Oral

This paper takes as a given that data management is now a wholly digital process within archaeology, and that geospatial applications is a critical element within this new normal. However, although ubiquitous in any process of study, the integration of GIS and other geospatial applications in archaeology is an uneven success. While commonplace, the level of sophistication and integration of geospatial technology wildly varies – from being a way to efficiently put 'dots on maps' to its integration with other spatial data and the use of geostatistical techniques. In many respects, this condition is reflective of a technological gap between senior members of the field trained in a largely analog environment and younger professionals who were trained both informally and informally in these concepts. Pockets of sophisticated approaches are conducted by individuals and teams in research institutes and centers, but the extent to which these applications have entered into the widespread training regime of the next generation still appears nascent. This lack of geospatial and informatics literacy holds potential to have a crippling effect upon the development of the discipline.

The extent to which geospatial and other informatic applications in archaeology move forward will be dependent upon the way in which these techniques are mainstreamed within the field. This will require the development of a body of archaeological geospatial science that is less dependent upon cognate disciplines, providing geospatial training as a *sine qua non* to aspiring professionals, and the hiring of geospatially-focused professionals within the academy and broader professional community in positions that are not dependent upon their skills in GIS but rather for their proficiencies in archaeology writ large.

197 HARBOURS AND ROUTES OF THE EASTERN MEDITERRANEAN DURING THE BRONZE AGE AND EARLY IRON AGE

Theme: Mediterranean seascapes

Organisers: Martin Garcia, Jose (Universidad Pompeu Fabra) - Antoniadis, Vyron (Academy of Athens) - Muñoz Sogas, Judith (Universidad Pompeu Fabra) - Ramirez Valiente, Paz (University of Nottingham)

Format: Regular session

Maritime routes and their terrestrial components formed the trade networks in which the anchorages and harbours were the funnels, both to imports and exports. Archaeological data and its interpretation is an important element in the study of the contacts between the Aegean, Cyprus, Anatolia, Egypt and the Levant in the Bronze and Early Iron Ages.

Anchorage/harbours such as Kommos in Crete, Pylos in mainland Greece, Enkomi in Cyprus and Ugarit, Sidon and Tell Abu Hawam in the Levant functioned as entrepôts for imported/exported products. The productive capability and access to raw materials of some of these anchorages/harbours were limited and often they just served as refinement of the goods originating in the hinterland. Those included agricultural products

which were sent out for the exchange of luxury items.

The importance of this topic lies in its interregional approach, analysing the interconnections between different Mediterranean regions; as well as exploring maritime and land transport technologies, routes and trading strategies.

We welcome papers related to harbour functions, inland harbour connections, imported/exported materials and maritime transport in the Aegean, Cyprus, the Levant and Egypt during the Middle Bronze Age, Late Bronze Age and Early Iron Age.

ABSTRACTS

01 THE PORTS OF MYCENAE: KALAMIANOS AND KORAKOU IN THE LBA MEDITERRANEAN

Author(s): Pullen, Daniel (Florida State University)

Presentation Format: Oral

While the importance to Mycenaean culture of long-distance maritime trade has long been recognized, little attention has been paid to the ports through which this trade took place. Likewise, the emphasis has been on long-distance (i.e., extra-Aegean) connections, and less on medium-distance (intra-Aegean) and short-distance (the various “small worlds” within the Aegean) connections. In this paper I situate the ports of Mycenae, including the recently discovered harbor of Kalamianos on the Saronic Gulf (by the Saronic Harbors Archaeological Research Project, or SHARP), the Argolic Gulf harbors of Tiryns and Nafplion, and Korakou on the Corinthian Gulf, within a framework of variable scales in trading connections and multiple modes of exchange, from palatial-elite controlled exchange to small-scale local exchanges. I suggest that the elites at Mycenae (or at the other Argive palaces such as Midea and Tiryns, whether individually or collectively) optimized their opportunities for trade by exploiting ports on all three major bodies of water surrounding the Argolid/Corinthia, namely the Argolic Gulf, the Saronic Gulf, and the Corinthian Gulf. The political mechanisms through which this exploitation may have occurred, from outright palatial control to independent merchants, are also explored in light of recent evaluations of Mycenaean political economy and maritime interactions.

02 MATERIAL AND HUMAN MOBILITY: THE DIVERSE CERAMIC WORLDS OF TEICHOS DYMAION, ACHAIA, GREECE

Author(s): Proulx, Benoit - Day, Peter (University of Sheffield) - Gazis, Michalis (Hellenic Ministry of Culture & Sports, Ephorate of Antiquities of Achaia)

Presentation Format: Oral

The Late Bronze Age of the Central and Eastern Mediterranean shows rich evidence for contacts between different regions and emerging trade relationships, peaking in the Mycenaean palaces and the immediate aftermath of their collapse. A key focus of this phenomenon has been the appearance of Aegean-style pottery in the Italian Peninsula, Sicily and Sardinia, including imports and locally produced imitations, alongside grey ware which blur the boundaries between Aegean and indigenous traditions, essentially hybrid ceramic forms.

The Aegean side of the relationship is less well understood and relies on the appearance of handmade burnished pottery (HBW) in Mainland Greece and Crete, as well as Cyprus in LH IIIB2 (Late 13th Century BCE). Debate has centred on whether this represents a mode of production reflecting social and economic collapse, the influx of foreign workers, or indeed a slave class.

It is harbours which offer a glimpse into this developing maritime world of diversity and Teichos Dymaion is vital to such an understanding. An acropolis-harbour at the entrance of the Corinth Gulf, the first landfall for ships coming from Italy, Teichos Dymaion was pivotal to trade and exchange from the central Mediterranean. The site contains very rich deposits of HBW and grey ware imports alongside canonical Mycenaean style pottery. The coarse, low-fired HBW stands in stark contrast to the high-fired calcareous clays of the local Mycenaean repertoire.

The implications of these contrasting ceramic worlds co-existing at the site of Teichos Dymaion are explored through an integrated macroscopic, petrographic and microstructural study, leading to the determination of the nature and source of raw materials along with the technological practices that characterise their production. A comparison of contrasting techniques of pottery production with communities of practice in both the Aegean and Italy is used to discuss population diversity at this key harbour settlement.

03 KORAKOU, EMPORIUM AND ENTREPÔT OF MYCENAEAN CORINTH

Author(s): Tzonou-Herbst, Ioulia (American School of Classical Studies)

Presentation Format: Oral

Corinth and its anchorage, Korakou, was an emporium and entrepôt already in the Late Bronze Age, the way it always was in its later history. Korakou, a hill overlooking the Corinthian Gulf and Lechaion harbor, played a significant role in Aegean Bronze Age studies. Since Carl Blegen's groundbreaking excavations in 1915 and 1916, a centenary conference in 2015 sparked renewed interest in the site, its legacy data, and its future.

It is argued that Korakou was the port city of a thriving settlement at Corinth in Mycenaean times. Excavations by the American School of Classical Studies in Corinth for the last 120 years have shown that the site was inhabited in the Late Bronze Age. Recent

excavations uncovered an extensive lower town and a tholos tomb in the plain between Korakou and Corinth. A wealth of imports, including a Syro-Palestinian merchant's hematite sphendonoid weight similar to ones from the Ulu Burun shipwreck, prove Corinth and Korakou's place along trade routes used for transporting goods and connecting people. Aigina and Mycenae needed a strong Corinth. It connected them to resources they desired and helped them in their interactions with areas they sold their products and distributed exotic prestige goods. The Corinthians participated in the cooking pot trade the Aeginetans were conducting with sites as far as Italy. Corinthian elites exploited and supervised route-segments within a wider network of long-distance routes. Corinth was a territorial state that exploited resources through her port at Korakou and held political control over her territory. The site of Korakou played a crucial role in the development of Corinth's entrepreneurial persona already from Late Helladic times. It continued to do so into Archaic times, when the harbor, located to the west of the hill, sent out colonists to Sicily in the 8th c. BCE.

04 RAMIFICATIONS DUE TO DIACHRONIC CHANGES IN AEGEAN TRADE ROUTES IN THE BRONZE AND IRON AGES

Author(s): Forsyth, Doug (University of St. Andrews)

Presentation Format: Oral

What happens when trade routes change? This paper seeks to examine the economic consequences of changes in trade routes within the Aegean area in the Bronze and Iron ages. Economic outputs by various communities in the region can be seen to increase or decrease through time. Changes in trade routes within the region, when examined on a case by case basis, can plausibly be correlative with these varying economic outcomes. This short presentation seeks to present some of the data in support of this hypothesis.

Early Bronze Age Cycladic origin obsidian, metal ores and ceramics found in Crete suggests that these items were sourced in the Cyclades and transported to Crete for consumption. In the Late Bronze Age, settlement site analysis shows a reversal of this pattern and elements of Cretan culture spread into the Cyclades, evidenced by material finds such as Minoan accounting techniques, architectural features, and ceramic design motifs. A prolonged hiatus of trade evidence followed the Late Bronze Age collapse of complex social systems in the Eastern Mediterranean. In the subsequent Geometric period, when evidence of trade is again observable, the trade routes that predominated were east-west rather than north-south. Concurrent with the emergence of east-west trade, the material output from certain Cycladic island groups seems to have been greater than can be seen among contemporary groups living in Crete. The idea presented here, is that intellectual innovations came into some of the Cycladic islands as result of eastern contacts that enhanced the ability of the inhabitants of those islands to exploit their economic base more effectively. It was the changes from the Bronze Age's north-south, to the Iron Age's east-west trade routes that were the catalyst for these groups' economic successes.

05 TEMPLES: THE SHOPPING CENTRES OF ANCIENT PORTS

Author(s): Muñoz Sogas, Judith (Universitat Pompeu Fabra; University of Sheffield)

Presentation Format: Oral

Greek temples have always been considered religious places, where people would meet to worship their Gods or to do sacrifices. However, some archaeological evidence from the first millennium BC suggests that several temples located near the sea were used as trading centres between Greek merchants and Near Eastern. This is the case of various Aegean sanctuaries from Samos, Ephesus, Eretria, Olympia, Sparta, Crete and even Cyprus.

Many imported materials were attested in these sanctuaries: Egyptian bronzes and ivories, Phoenician inscriptions and imitations of Egyptian inscribed objects, as well as Nimrud-style materials. Also local and imported objects of common commerce, such as amphorae, denote the possibility of economic exchanges within the temples.

Nonetheless, some of these temples not only were used as commercial stopping points, but also as workshops. The Temple at Kition-Bamboula seems to have been connected to metalworking, according to Phoenician inscriptions and metal bowls; and the Temple of Artemis Orthia could have been a workplace for Near Eastern ivory carvers (although their ivories could have also been manufactured at the Idaean Cave Sanctuary (Crete) and imported from there).

Table ceramics also suggest consumption of food and drinks within the temple, reminding us that seafarers would not only stop there to sell products but also to rest. Moreover, sailors seem to need sex just as much as food, drink and divine protection: Prostitution was therefore a key element in these multi-functional buildings, as suggested by the inscriptions at Kition-Bamboula.

Therefore, maritime sanctuaries were not only religious buildings but also stopping points between the Eastern and Western Mediterranean where seafarers would rest, pray to their Gods and exchange (or even produce) objects with the local communities.

06 EARLY IRON AGE PHOENICIAN COMMERCIAL PATTERNS IN HELLENISTIC DELOS? A COMPARATIVE STUDY OF OVERSEAS ESTABLISHMENTS

Author(s): Antoniadis, Vyron (Academy of Athens)

Presentation Format: Oral

The archaeological record has demonstrated that during the Early Iron Age (EIA), Phoenicians had created complex networks of trading posts in the Aegean and the western Mediterranean. It has been suggested that some of these sites reflect a mixture of

religious activity and trade. A frequently used example of this view is the structure known as "Temple B" at Kommos (800-600 BC) in Crete. The combination of cult and commercial activities by the Phoenicians in Aegean context is something that has not been studied ethnologically in depth so far.

In 167 BC, the island of Delos began to function, under the Roman control, as a free port, and quickly became the commercial centre of the Eastern Mediterranean. Due to these circumstances, Delos presents a unique opportunity for studying the Phoenicians overseas in the second century BC. There are various finds on the island related to the presence of people from Beirut, Sidon and Tyre. They range from inscriptions to religious symbols. Undoubtedly, the building, which is known as the Koinon (association) of the Poseidoniasts, is the most important archaeological feature of the Phoenician presence. Evidence for both trading and cult activity has been recorded in this building.

The present paper compares this Hellenistic religious and commercial complex with prior overseas EIA Phoenician establishments. The aim of this study is to reveal whether this Koinon reflects past Phoenician commercial activities and mechanisms or it constitutes an invention of the Hellenistic Period and the regulations imposed by the local Delian authorities, or by the Romans. With the present paper, one hopes that the study of this Hellenistic structure would offer a better understanding of overseas commercial and cultic Phoenician establishments in the Aegean during the EIA.

07 INSTILLING KNOWLEDGES: CONSEQUENCES OF THE EARLY IRON AGE MARITIME CONTACTS ON ARCHAIC GREEK HARBOUR ARCHITECTURE

Author(s): Mauro, Chiara Maria (University College Dublin)

Presentation Format: Oral

Analysing the period between the collapse of the Bronze Age civilisations of Crete and mainland Greece and the society based on poleis which emerges from the earliest Greek historical sources is extremely complex. In spite of the fact that traditionally this period has been thought of as a "Dark Age", recent archaeological evidence shows that there have been indeed many contacts between different Eastern Mediterranean populations. Then, the aim of this contribution is to underline this continuity through a study of the persistence in harbour architecture; at the same time, possible major changes will be also considered. Firstly, Bronze Age and Early Iron Age harbours on the Eastern Mediterranean coasts will be analysed, in order to see what did they look like and what kinds of structures did they present; secondly, the attention will be moved to Early Greek harbours to identify possible elements of continuity (and discontinuity) in harbour architecture. The purpose is to determine what were the harbour elements that survived to the Mycenaean collapse, or that were assimilated by the Greeks through direct contacts with other neighbouring cultures (mainly Phoenician and Egyptian); and what were the harbour elements that did not seem to be documented in Early Greek harbours.

08 VIRTUAL RECONSTRUCTION OF AN ANCIENT SHIPYARD ON TURKEY'S DANA ISLAND

Author(s): Denker, Ahmet (Istanbul Bilgi University) - Oniz, Hakan (Secuk University)

Presentation Format: Oral

Dana Island is a small island at the Silifke district of Mersin City in the east of the Rough Cilicia region on the Mediterranean coast of Turkey. It is located 2,300 meters from the shores of the main land, 2,700 meters in length, 900 meters in width and 202 meters in height.

The island is located between two archaeologically important sites, Taşucu headland and Tisan-Aphrodisias headland on the borders of Silifke. Rough Cilicia has been subject to regional and international politics and trade since ancient times because of both the cedar trees in the Taurus mountains and iron ore deposits in the Gazipasha and Anamur regions.

There is more than one decisive reason for believing that this island was used in the bronze age as a shipyard. Firstly, the necessary wood resources for shipbuilding are very close to the island. Second reason to choose it here as a shipyard is being an island it is a more secure place for the warships. Remnants of a castle had reinforced this belief. Another reason to select this island as shipyard is natural slope to landing. The north-west of the island has a slope suitable for a ramp from the sea to the land.

The 274 slipways with their ramps and some connected structures are visible on the coastline.

In order to model the island in 3D starting with photogrammetry, a series of stereoscopic photos were taken from the deck of a boat which had encircled the island with a distance (radius) of roughly 2000 m. The processed images were tied together after their coordinate values were adjusted and the combined imagery date was converted into 3D-imagery (by using Agisoft). This enabled us to reconstruct the model and test the hypothesis of its use in the past as a naval base.

09 TELL ABU HAWAM'S FUNCTION IN THE LATE BRONZE II: CONVERGENCE OF TERRESTRIAL AND MARITIME ROUTES

Author(s): Artzy, Michal (Hatter Lab., RIMS, University of Haifa)

Presentation Format: Oral

Below the Carmel Ridge, lies the small site of Tell Abu Hawam. It is situated on the Kishon River estuary, in the vicinity of the modern city of Haifa and its active international port. The site, no more than 4-5 acres, was partially excavated several times. Mainly in the 1930's by R.W. Hamilton, the British Mandate and in the 1980's by Dr. J. Balensi. A salvage excavation project carried out by the

Recanati Institute for Maritime Studies at the University of Haifa in cooperation with the Israel Antiquities Authority unearthed the Late Bronze II anchorage of the site. The abundance of wares, local and imported, fine and utilitarian, is beyond the scope associated with such an anchorage site. The majority of the ceramics found are imports and the largest segment can clearly be attributed to Cyprus, while others are from the Aegean, Western Anatolia, the Syro-Lebanese coast and Egypt.

There were several other anchorages in the small area bounding the Carmel coast, which might have served as mere 'kiosk' type of stopover for the vessels sailing this part of the Mediterranean. So, questions as to why this particular site was a center for the international trade in the 2nd part of the 2nd Millennium, the LBIIA/B are addressed in this lecture. Was the anchorage serving mercantile entities, as a conduit/funnel of agricultural staples originating in the valleys and goods to be shipped for as far as Transjordan? Did it serve a particular City State as its major outlet to the Mediterranean? Was it an anchorage serving as a transshipping center? Or all of these? In addition, how was it related to the anchorage of Tel Akko, situated on the other northern side of the Haifa bay?

10 TEL RISIM, AN INDICATOR OF AGRICULTURAL GOODS SHIPPED FROM THE JEZREEL VALLEY TO THE HITTITES DURING THE LATE BRONZE AGE

Author(s): Martin Garcia, Jose (Universidad Pompeu Fabra) - Atrash, Wallid (Israel Antiquities Authority) - Artzy, Michal (University of Haifa)

Presentation Format: Oral

Among the Hellenistic remains from a salvage excavation conducted by Dr. Walid Atrash in 2005 for the Israel Antiquities Authority in the outskirts of Tel Risim (the Jezreel Valley, Israel), an architectural element dated to the Late Bronze Age II by the ceramic finds was found.

While most of the ceramics encountered were of local paste, some bore clear similarities in shape with Cypriot and coastal Anatolian. Imported Cypriot ceramics, such as White Slip II, were also found. Among the Plain wares, both local and Cypriot provenance Plain White Wheel Made (PWWM) was discovered. The nearest parallels to these wares were found at the anchorage of Tell Abu Hawam (TAH). Among the domestic wares are locally made large, open vessels, their form, however, seems to have no parallels in the local Levantine repertoire. The rim's shape is similar to that of the Anatolian Grey Ware kraters suggesting an Anatolian or Cypriot origin.

Given the ceramic similarities between those found at Tel Risim and TAH, we propose that the site of Tel Risim is an archaeological indicator of the agricultural surplus conveyed from the Jezreel Valley to the anchorage of TAH for shipment to Hittite world via the Syro-Lebanese coast and Ugarit.

a. INSCRIBED STIRRUP JARS AND THEIR ROLE IN MYCENAEAN TRADE NETWORK

Author(s): Ramirez Valiente, Paz (University of Nottingham)

Presentation Format: Poster

Mycenaean stirrup jars are found throughout the Eastern Mediterranean main harbours and trading routes. However, stirrup jars with Linear B painted inscriptions (ISJs) travelled only within Mycenaean Greece. They are attested so far on Crete and the Greek mainland dating from around the LM IIIB period. The majority of the ISJs were produced in western Crete, particularly in Kydonia. Inscriptions consist mainly on personal names, place names and/or toponyms or ethnics. This possibly represents the potter/producer, the place of production and the collector. Some of the ISJs add the inscription wa-na-ka-te-ro (relating to the wanax) which has served to argue in favor for the palatial control of this production and circulation of pottery. Nonetheless, in opposition to the Linear B tablets ISJs were not restricted only to the administrative centres.

Research focusing on ISJs has resulted into a prolific debate regarding the function of the inscriptions, the degree of Mycenaean literacy or their contents and provenance. It has been suggested that inscriptions acted as 'trademark' or labels (Chadwick 1976, Haskell 1983), identified as part of the administrative functions in Crete (Alfen 1996, Olivier 1996) or as symbols of prestige and gift exchange (Duhoux 2011, Driessen et al. 2015).

Through an analysis of the production, circulation and purpose of this type of pottery, the aim of this paper is to provide a fresh understanding of the operation of local Mycenaean trade networks and the role (or not) that the palatial administration could exert in these networks.

199 WHAT WE ARE LEARNING FROM EXPERIMENTAL ARCHAEOLOGY?

Theme: Theories and methods in archaeological sciences

Organisers: Paardekooper, Roeland (EXARC) - Mytum, Harold (University of Liverpool, Archaeology, Classics and Egyptology)

Format: Regular session

Experimental archaeology is the process of forming and testing hypotheses by replicating an action, leading to statements on the construction, use or discard of an archaeological object or feature. A hands-on immersive comparison with the past is created. But archaeology is more than a simple answer to "who were the people who lived here in the past".

This session discusses the way experimental archaeology taught us ways we can learn insights from the archaeological past relevant for the present, in German: Gegenwartsrelevanz. Can we make concrete as tough as the Romans did? Austrian contractors for example are looking with interest into archaeological experiments. Were Bronze Age houses with insulated double walls “smarter” than current sustainable building techniques? Are Stone Age ways of food preservation the new hit because these are healthier than what we find in the supermarket?

We look for case studies as well as a thorough discussion about the use of experimental archaeology beyond the simple reinvention of techniques.

ABSTRACTS

01 WHAT WE ARE LEARNING FROM EXPERIMENTAL ARCHAEOLOGY?

Author(s): Paardekooper, Roeland (EXARC)

Presentation Format: Oral

Experimental archaeology is fascinating and increasing in popularity. Worldwide, there are over one hundred universities offering education in experimental archaeology; sometimes an immersive week to learn hands-on about material culture, in other cases full PhDs are produced.

Experimental archaeology conferences and sessions are popping up around the world, not only in Europe, but also in North America, South Africa and Australia. In many cases, there is a crossover between experimental and experiential archaeology.

But if we take a holistic approach to archaeology, seeing it as the science of ‘everything human’ as far as we can learn this through excavated remains and information, is it not about time to see what we can learn from the past through archaeology for our present society? Archaeology would not be the first science, which contributes to making our current life easier.

We can learn lessons from the Pre-Columbian Era about rebuilding after natural disasters, for example, and NASA patented using chain mail for its landrovers, based on archaeological examples. It is a matter of testing / experimenting, followed by application.

Archaeology can make a valid contribution to society, not just by explaining how life was in the past, but what we can learn for the future.

02 MUD BRICK BUILDING IN ANCIENT EGYPT - AN EXPERIMENTAL APPROACH

Author(s): Debowska-Ludwin, Joanna - Rosinska-Balik, Karolina (Jagiellonian University in Krakow)

Presentation Format: Oral

The most impressive ancient Egyptian structures were made of stone. They mostly survive and give the impression of the state in the Nile Valley monumental architecture. However, these structures are not the only building types of those times. Typical of the first Egyptian foundations are monumental mastaba tombs and large administrative buildings, known e.g. from Saqqara, Naqada or Tell el-Farkha, executed without stone elements. The early architecture of Egypt bases on simpler constructions of easily available and effortless in production material – mud bricks. The main question about this kind of material is its economy of manufacturing. It was so common that it must have been easy and quick for preparation, but how easy and quick was it? How much workload did it require? What amount of ingredients did it need? How long did it take to prepare a batch of bricks ready to use in a building process? Finally, how vast was the area necessary to produce and prepare a sufficient amount of bricks?

In the presentation we will refer our experimentally supported attempt to find some answers and possible calculations to bring a closer insight into the mud brick architecture issue. The experiment was based on our experience gathered in the many years long course of research at the Pre- and Early Dynastic (4th millennium BC) site of Tell el-Farkha, located in the eastern Nile Delta in Egypt. The project was carried out using data collected at the site, which gave us a strong reference material in the early Egyptian mud brick problem. To supplement our archaeological knowledge and solve some practical production difficulties local craftsmen familiar with gradually vanishing traditional building techniques also contributed to the experiment.

03 WHAT GOES AROUND COMES AROUND: LESSONS FROM EXCAVATING AND REBUILDING A RECONSTRUCTED IRON AGE ROUNDHOUSE AT CASTELL HENLLYS, PEMBROKESHIRE, WALES

Author(s): Mytum, Harold (University of Liverpool)

Presentation Format: Oral

The long-term reconstructions at Castell Henllys, Pembrokeshire Coast National Park in Wales, offer opportunities for longitudinal study of decay, repair, and management. In 2017, the roundhouse that had been excavated and then reconstructed on the original site 35 years ago was dismantled, recorded, excavated, and has been rebuilt during 2018 according to a new design modified on the basis of the lessons learnt from this long-term project. The paper's author directed the original excavation and devised the reconstruction design, and worked with James Meek of the Dyfed Archaeological Trust in its re-examination as part of an integrated University and Community-based project. He also modified the proposed replacement reconstruction design. The results highlight the ecological implications of house building and the low-level requirements for continuing maintenance. They also reveal that some adaptations to structure during its life, inspired less by the archaeological evidence and more by modern perspectives regarding ma-

terials and structural rules, were inappropriate and ineffective. The lessons learnt have informed the replacement reconstruction, which when combined with the archaeological data should ensure an even more robust structure on the long-term. These lessons also have value when considering green solutions to house-building in the present, and the ways in which over-engineering can be inappropriate when applied to traditional designs. The excavated evidence also revealed how the space within the building was used, and this informs both interpretation of Iron Age data and how contemporary visitors will interact with the new reconstruction.

04 GROWING THE PAST: PREHISTORIC FOOD PRODUCTION AS A MODEL FOR RESILIENCE IN A CHANGING CLIMATE

Author(s): Mueller, Natalie (Cornell University) - Patton, Paul (Ohio University)

Presentation Format: Oral

Human population growth and industrialization has placed unprecedented burdens on agricultural production and global food access. By 2050, the risk of hunger and malnutrition worldwide is estimated to increase by approximately 20% due to the impacts associated with global climate change. Drought, the expansion of crop pests, and variable rates of precipitation partly due to global climate change, and agricultural emphasis on a small number of carbohydrate rich seed crops with very little genetic diversity have further contributed to concerns for global food security. Currently, wheat, maize and rice provide two-thirds of food consumed globally. These cereals are low in protein, and using them to provision animals as a source of protein is an inefficient way to produce food for a growing global population. As climate change alters local environmental conditions, diversified farms may become necessary to ensure the economic success of farmers and to maintain global food security. In order to meet the needs of diversified local food systems, we suggest that the archaeological record is an invaluable resource. Our research is focused on the lost crops of eastern North America, a diverse group of annual plants that were cultivated for their edible seeds for thousands of years by Native Americans. We are conducting greenhouse and field experiments with these crops to better understand the archaeobotanical record, and to explore the possibility of re-domesticating these species. We will introduce each of the lost crops and its potential agronomic and nutritional value, then present preliminary results from our experiments. Diverse crop systems today are under threat, but for most of the history of agriculture they were the norm. We can use the archaeobotanical record to prospect for useful plants that are no longer grown and to better understand the social conditions that create and sustain agrobiodiversity.

05 AN EXPERIMENTAL PROJECT TO REPRODUCE IRON AGE IBERIAN KILNS

Author(s): Jornet, Rafael (University of Barcelona; Món Iber Rocas SL) - Morer de Llorens, Jordi (Món Iber Rocas SL) - Gil Limón, Borja - Cardona Colell, Ramón (Centre d'Estudis Lacetans)

Presentation Format: Oral

This project aims to reproduce and record the reconstruction and firing of two Iron Age pottery kilns so as to deepen knowledge of the development and manufacturing processes of pottery from the Iberian Culture. To carry out this ambitious project, the team of the C.E.P. (Camp d'Experimentació de la Protohistòria) of Verdú opted for controlled and scaled (1:1) reproductions of two previously excavated kilns. Furthermore, given the complexity of the process of construction and comprehension of these types of features, the team chose to reinforce the archaeological evidence with ethnographic data, in particular data gleaned from Berber kilns, a type that is still in operation today in central Morocco in the Errachidia region. The ethnographic records also comprise data collected from local Verdú potters. It is worth mentioning that this alternative line of research adopted by the C.E.P. deepens knowledge of the past, serves as a complement to archaeological experimentation and generates reconstructive hypotheses. The archaeological evidence of the experimentation was obtained from kilns recently excavated at the Iberian settlement of Hortes de Cal Pons (Pontons, Catalonia). Specifically, the C.E.P. team set out to test the hypothesis of construction of kilns 4 and 6 of the Hortes settlement. The function of kiln 6 was tested by two experimental firings. Broadly speaking, the kilns are of the vertical draught type with a lower circular combustion chamber featuring a central pillar, an axial wall and an upper firing chamber. The lower chamber is most often partially underground to ensure thermal insulation and commonly equipped with a corridor or praefurnium. A good control of the fire is carried out in the corridor or stokehole and not directly in the combustion chamber. This distributes the heat more uniformly through the perforations of the grate. The grate serves, in fact, as a second fire regulator.

06 EXPERIMENTAL KNAPPING SIMULATIONS AND THE CREATION OF NEW (OLD) BEHAVIOURAL DATA

Author(s): Stade, Cory (University of Southampton)

Presentation Format: Oral

Experimental archaeology offers information far beyond the reinvention of techniques and technologies used in the past. Through experimental simulations, we can learn about how artefacts were taught and learned, allowing researchers to infer past mental processes. This presentation will illustrate two case studies: 1) in an experiment simulating different methods by which Palaeolithic stone tool technology is taught and learned (Stade 2017), a pattern of reduced morphological variation (higher standardisation) was identified in high fidelity social learning groups. This supports that highly standardised stone tool assemblages might only be possible with the perceptual and cognitive abilities that are necessitated by complex social learning abilities (like theory of mind and language). 2) In an effort to measure how 'copyable' different knapping technologies are, footage of knapping events was analysed and knappers' gestures broken down into a discrete list. These individual gestures were then assessed for how visually and functionally perceptible they would be to others, allowing for the creation of a 'copyability score'. This copyability score could then be applied

to different Palaeolithic technologies, or even individual tools, to support the complexity of social learning that would be needed for their successful transfer. The ability to watch Palaeolithic individuals learning to knap is impossible. Experimental archaeology is invaluable for allowing present people to experience the past, but it is also a significant tool allowing researchers to create otherwise non-existent data, such as recreating these long-lost learning situations.

07 EXPERIENCE IN RECONSTRUCTION AND USING OF SINTASHTA CULTURE ARROWHEADS

Author(s): Semyan, Ivan (South Ural State University; Archaeos - experimental archaeology center)

Presentation Format: Oral

Sintashta culture of the Southern Urals is the most technological and militarized culture of the Bronze Age in steppes of Northern Eurasia.

More than 20% of the Sintashta burials have a military context. The culture is known for finds of the details of the world's oldest chariots (near 2100 B. C.), fortification traditions (23 fortified settlements), found details of bows, details of the armour made of elk horns. Privileged estate consisted of warrior-shepherds guarding cattle, for them and intended advanced weapons. Despite the developed complex of metal weapons, the main weapon of the ancient warrior-shepherds was the bow. Researchers found bone details of composite bows. The collection of arrowheads of Sintashta culture is more than 200 examples, which many times exceeds the indices of other cultures of the Southern Urals in the Bronze Age. In the quiver set of Sintashta archers were presented stone, bone and very technologically advanced bronze arrowheads.

Stone types of arrowheads had a wide variety of shapes and sizes. We conducted an experimental study of the manufacturing process and use of all types of arrowheads. The most massive stone arrowheads are made of thin biface with the technology of jet pressing. They are found mainly in elite burials (with a chariot, a bow). In the materials of the settlements there are many finds of preforms of these stone arrowheads. Tests of this type of arrows have demonstrated that their lethal force is higher than that of the tips made of the flake-plate.

In the manufacture of bronze arrowheads, we completely repeated the entire technological process from mining ore to casting the product. Tests of bronze arrowheads have shown that they successfully pierce armor from the elk's horn, to which stone and bone arrows are not capable.

08 RED ALERT? THE COLORS OF HEAT-AFFECTED QUARTZITE

Author(s): Bentsen, Silje (University of the Witwatersrand)

Presentation Format: Oral

Thermally altered rocks are known from numerous contexts around the world and can contribute much information to our understanding of fire-related behaviour. I report on two pilot studies to examine how heat exposure affect the colours of quartzite from the Eastern Cape, South Africa. Locally sourced quartzite samples were heated on an open fire, and some of the samples were subsequently submerged in water. The colours of the samples were recorded visually, with the Munsell colour chart and by digital photography before the experiments and between each heating episode. The software package R was used to convert Munsell colour values to numerical values for statistical analysis, and principal component analyses (PCA) were conducted on converted Munsell colour values as well as digitally recorded values. The experimental samples displayed colours, cracks and breaks similar to those recorded in rocks used for cooking. A comparison of the colour recording methods show that the digitally recorded colour values best described the differences between unheated samples and samples heated three times. It was also to a certain extent possible to distinguish between heated samples and samples that had been heated and water-exposed. These results have implications for the understanding of heat-exposed quartzite and cooking techniques in the global archaeological record.

09 WHAT HAVE WE LEARNT AFTER 27 YEARS OF EXPERIMENTAL ARCHAEOLOGY AT L'ESQUERDA?

Author(s): Ollich, Imma - Pratdesaba-Sala, Albert (Universitat de Barcelona; Museu Arqueològic de l'Esquerda) - Rocafiguera, Montserrat (Museu Arqueològic de l'Esquerda) - Serrat, David (Universitat de Barcelona) - Ocaña, Maria (Museu Arqueològic de l'Esquerda) - Amblàs, Oriol (Escola d'Art i Superior de Disseny de Vic; Museu Arqueològic de l'Esquerda) - Pujol-Camps, Àngels (Museu Arqueològic de l'Esquerda) - Cubero, Carme (Universitat Oberta de Catalunya; Museu Arqueològic de l'Esquerda)

Presentation Format: Oral

L'Esquerda's archaeological finds motivate us to jump into experimental archaeology projects. The excavation of the medieval granary in 1986 and the collaboration with Dr. Peter J. Reynolds (Butser Ancient Farm) encourage us in 1990 to start sowing ancient grains of the same specimens recovered from the excavation (*Triticum dicoccum*, *Hordeum vulgare*, *Secale cereale*, *Vicia faba*, *Vicia sativa*). Since then, we had been experimenting with the grains (sowing and harvesting), the full-scale construction of a medieval granary and a smithy using ancient techniques, iron forging and bronze melting till the construction in 2015 of a full-scaled Carolingian wooden watchtower.

Through 27 years of Experimental Archaeology Projects, we had gathered a great amount of data and results. But after all these experiments, recorded data, analysis, many questions appear: what have we learned from all these experiments? Are they really useful for archaeological research? Can we use experimental archaeology for teaching scholars? And can we use it for diffusion and cultural promotion? Is there any difference between an archaeological experiment and a demonstration?

In this paper we want to present what have we learned from all these experiments along 27 years, opening a discussion about it. What is the real difference between Experiment and Experience, between theory and practice, between the objectives and the results, between Reconstruction and Science?

10 EXPERIMENTAL ARCHAEOLOGY AND EXPERIMENTATION AS A LEARNING TOOL OF THE IBERIAN PERIOD: THE IBERIAN CITADEL OF CALAFELL

Author(s): Gómez Gutiérrez, Manel (Organisme Autònom Municipal Fundació Castell de Calafell) - Pou Vallès, Josep (Ajuntament de Calafell)

Presentation Format: Oral

The Iberian Citadel of Calafell is an archaeological site of the Second Iron Age, excavated since 1983, with a time span from the 6th to the 2nd century BCE. A project of architectural restitution using experimental archaeology methodologies has been developed since the year 1992.

From the archaeological remains recovered in this site and in others of the same period and culture of the Iberians, as well as the ethnographic comparison with North African settlements, some of the houses, towers and walls have been built up using the same materials and techniques as the Iberians of 2300 years ago.

Once restored architectonically, the Iberian Citadel of Calafell has fostered various experimental actions and experimentation projects which have been helpful in order to spread knowledge about the culture of the Iberians from several fields. Thus, iron metalurgy, minting, pottery, wine and cordage making have been some of the projects made lately. They have contributed to bring closer to both overall public and especially to students, various aspects of the Iberian culture. Likewise, this way of dissemination of the past can also be a good learning tool so that citizens ponder on this knowledge and relate it to modern times, in terms of efficiency, sustainability or comfort for instance.

11 EXPERIMENTAL ARCHAEOLOGY AND ACADEMIC TRAINING AT THE AUTONOMOUS UNIVERSITY OF BARCELONA (UAB)

Author(s): Palomo, Antoni (Museu d'Arqueologia de Catalunya-Barcelona) - Díez-Canseco, Celia - Fernández-Nuñez, Sofía (Departamento de Prehistoria, UAB) - Gascón, Mireia (CIPAG) - Gironès, Ivan (GRAMPO, Departamento de Prehistoria, UAB) - Gonzales, Alex (Departamento de Prehistoria, UAB) - Mangas, Alberto (Laboratori d'Arqueologia Quantitativa, Departamento de Prehistoria, UAB) - Monforte-Barberán, Andreu (GRAMPO, Departamento de Prehistoria, UAB) - Ripoll, Joaquim (Laboratori d'Arqueozoologia, UAB) - Eguiluz, Marina (ASOME, Departamento de Prehistoria, UAB)

Presentation Format: Oral

Autonomous University of Barcelona (UAB) imparts since 2016 specific training in Experimental Archaeology in its Prehistory, Antiquity and Middle Ages Official Master program. Experimental Archaeology has had a solid presence during the last three decades at UAB, where several seminars, congresses and workshops had taken place, addressing many topics like manufacturing of lithic and wood tools, food processing, etc. This work has influenced various research lines in different fields based in Experimental Archaeology, developed in MA dissertations and PhDs.

For us, experimentation is inherent and an integral part of the scientific method (Baena and Terradas 2005). It is the base of scientific research and also, therefore, of archaeological research.

In this communication we would like to present a brief history of the trajectory of these projects in archaeology at UAB, and a selection of experiment proposals from the Master students in the past two academic years.

The different research projects carried out during the Master's degree have focused on technical and functional issues such as the function and production of stone tools, ceramic production and other aspects related to the conservation of plants in the archaeological register. Some of the aspects worked on in the master's degree will allow the students to develop their future research

Some of the aspects worked on in the master's degree will allow the students to develop their future research

a. FIRE CONDITIONS IN A CHALCOLITHIC BURNT HOUSE OF MAJDANETSKE (TRIPOLJE CULTURE, UKRAINE) BASED ON ANALYSES OF ARCHAEOLOGICAL AND EXPERIMENTALLY-PRODUCED DAUB

Author(s): Dal Corso, Marta (Inst. of Pre- and Protohistoric Archaeology - Kiel University; CRC 1266 Scales of Transformation - Kiel University) - Dreibrodt, Stefan (CRC 1266 Scales of Transformation - Kiel University; Inst. of Ecosystem Research - Kiel University) - Boden, Pia - Martini, Sarah (Inst. of Pre- and Protohistoric Archaeology - Kiel University) - Hofmann, Robert (Inst. of Pre- and Protohistoric Archaeology - Kiel University; CRC 1266 Scales of Transformation - Kiel University)

Presentation Format: Poster

Pieces of Daub unearthed during an excavation of a burnt house in Majdanetske (Tripolje Culture, Ukraine) were analyzed to infer the burning conditions of the house and the material used as temper. Colors (spectrometric measurements, surface and powder), magnetic susceptibility measurements (surface and powder), mineral assemblage (xrd), and phytolith assemblage and preservation (light microscopy) of the pieces were determined. Statistical analyses prove that the daub pieces recovered in the excavated house show significant differences.

A parallel experiment was carried out with the production of “synthetic daub”. The silty/clayey sediment (Löß) that forms the parent material at the site was tempered with chaff and straw of *Triticum monococcum* L. and mixed with water to produce a kind of plaster. Bricklets of this material were then burned for different times (30min-240min) at different temperatures (550°C-940°C) under both oxidizing and reducing conditions. The synthetic daub samples were measured and compared to the archaeological daub pieces.

Assuming a similar composition of the plaster (e.g. iron content, organic temper), very different burning conditions (temperature, oxygen access) can be deduced for certain parts of the house. Further work is needed to ascertain whether the numerous other houses of the settlement burned down in a similar way.

200

ENTREPRENEURS AND MERCHANTS IN THE LATE BRONZE AGE – EARLY IRON AGE MEDITERRANEAN

Theme: Mediterranean seascapes

Organisers: Pullen, Daniel (Florida State University) - Nakassis, Dimitri (University of Colorado) - Rahmstorf, Lorenz (Universität Göttingen)

Format: Regular session

Most recent studies of trade and exchange in the Late Bronze Age eastern Mediterranean have focused on long-distance maritime trade, either because the products are generally easier to identify (exotica, raw materials, luxury goods) and/or have privileged (royal or palatial) gift exchange as the mechanism for that trade, in large part because of Late Bronze Age textual evidence. In the Aegean, increasing attention has been paid to short- to medium-distance trade, due to the recognition of the importance of “small world” exchange networks. In this session, we consider all scales of maritime trade and exchange as existing on a continuum from the small worlds within the Aegean to the greater Mediterranean world. By focusing on non-palatial exchanges, we are able to draw attention to the role of merchants and entrepreneurs in effecting these exchanges at all levels, from intra-polity to long-distance trade. Though the products and polities involved may be different in the Early Iron Age than in the palatial Late Bronze Age, we argue that some of the mechanisms of trade at all levels remain the same, that is through merchants. Recognition of the role of merchants in the Late Bronze Age economies brings about a better understanding of the economies of the palatial Aegean period and in the transition to the pre-polis Early Iron Age.

ABSTRACTS

01 MERCHANTS, MARKETS, AND EXCHANGE IN THE LATE BRONZE AGE – EARLY IRON AGE MEDITERRANEAN

Author(s): Pullen, Daniel (Florida State University) - Nakassis, Dimitri (University of Colorado) - Rahmstorf, Lorenz (Universität Göttingen)

Presentation Format: Oral

Over the last decade or so, scholars of the economy of the Bronze Age Aegean states have increasingly recognized the importance of the non-palatial components of ancient economies, but the role of market exchange and merchants has not received the attention it deserves, despite the overwhelming evidence for merchants and markets in the following Early Iron Age. By focusing on non-palatial exchanges, we are able to draw attention to the role of merchants and entrepreneurs in effecting these exchanges at all levels, from intra-polity to long-distance trade.

Most recent studies of trade and exchange in the Late Bronze Age eastern Mediterranean have focused on long-distance maritime trade, either because the products are generally easier to identify (exotica, raw materials, luxury goods) and/or have privileged (royal or palatial) gift exchange as the mechanism for that trade, in large part because of Late Bronze Age textual evidence. Non-royal exchange has received very little interest by scholars.

In this paper, we consider the various bodies of evidence for mercantile exchange, such as the distribution of ceramics, systems of weights, and potential infrastructure to facilitate trade, as well as the variability of scales of mercantile exchange as existing on a continuum from the small worlds within the Aegean to the greater Mediterranean world. Recognition of the role of merchants in the Late Bronze Age economies brings about a better understanding of the economies of the palatial Aegean period and in the transition to the pre-polis Early Iron Age.

02 MERCHANTS IN THE ARCHAEOLOGICAL RECORD OF THE LATE BRONZE AND EARLY IRON AGE MEDITERRANEAN AND BEYOND

Author(s): Rahmstorf, Lorenz (Seminar für Ur- und Frühgeschichte, Universität Göttingen)

Presentation Format: Oral

Merchants and traders appear in the written records of the Ancient Near East and Ancient Egypt in the Bronze and Early Iron Ages. They are not traceable in the Aegean Linear B texts, at least no word for them has yet been identified. Their role as agents of a pal-

ace or as independent entrepreneurs remains discussed by historians, but both types of activities are not necessarily contradicting each other. It is more difficult to grasp by archaeological means the individuals who were involved as the main actors in exchange processes. Some graves from sites in the Levant, Cyprus and the Aegean as well as shipwreck finds give insights into the typical range of tools they used. These include weighing equipment (weights and scales), specific metal working tools or even stills and writing boards. The various sets of weights, their morphology and metrology, and the associations to other finds in grave assemblage are sometimes strikingly similar (e.g. Achziv in Israel and Lefkandi in Greece in the 10th century BC). It is likely that such similarities in the archaeological record indicate the mobility of individuals. This may also explain some comparable features and similarities in find assemblages and grave associations in the eastern but also western Mediterranean and even temperate Europe already during the 13th century BC.

03 **MERCHANTS, CULTURAL BOUNDARIES, AND ORDERLY EXCHANGE IN THE LATE BRONZE AND EARLY IRON AGES**

Author(s): Murray, Sarah (University of Toronto)

Presentation Format: Oral

While scholars of the Late Bronze and Early Iron Age Mediterranean have increasingly emphasized the role of merchants in mediating trade in the Mediterranean at both large and small scales, the mechanisms of interaction and transaction that facilitated merchant-centered trade remain undertheorized. Textual evidence from around the Mediterranean suggests that merchants were often viewed with suspicion by political and social elites, particularly because they operated across meaningful cultural and political boundaries and may have been seen as a threat to social order. If we accept that such attitudes were prevalent among consumers of merchant-based trade, it follows logically to interrogate the mechanisms by which merchants circumnavigated fear and ideological boundaries in order to conduct transactions efficiently.

In this paper I consider the archaeological and textual evidence for the activities of merchants in the Late Bronze and Early Iron Age from the point of view of social order, that is, how practice and institutions helped constrain interactions with merchants in ways that were conducive to maintaining social order. I suggest some likely mechanisms, including sealing and weighing practices and shared ritual, that emerge from the relevant evidence and that may have constrained interactions between merchants and non-merchants in order to allow transactions across meaningful cultural boundaries to proceed without undue friction. I argue that interactions between merchants and others were constrained primarily by consensus rather than coercion, and proceeded in an orderly fashion largely as the unintended consequence of people pursuing their own interests rather than because of overt policies, rules, or regulations.

04 **MERCHANTS AND BALANCE WEIGHTS ON LATE BRONZE AGE CYPRUS**

Author(s): Siennicka, Malgorzata (University of Göttingen, Institute of Archaeology)

Presentation Format: Oral

Cyprus became a significant trade spot in the maritime networks of the East Mediterranean during the later 2nd millennium BCE. Because of the considerable intensification of copper production and export during the Late Cypriote period, external contacts of the island has greatly increased and it transformed into the important trade partner of Egypt, Levant, Anatolia and the Aegean. As active participants in the international trade, especially in export of copper, the merchants from Cyprus have most probably adapted existing metrological systems from other areas. Balance weights came to light at numerous Late Bronze Age sites on Cyprus in various contexts: in settlements (e.g. Hala Sultan Tekke; Apliki-Karamallos), in graves (e.g. Hala Sultan Tekke; Ayia Irini-Paleokastro; Paleokastro by Ayia Irini) and in hoards (e.g. Kalavassos-Ayios Dhimitrios; Enkomi; Pyla-Kokkinokremos). The primary aim of this paper is to review the weighing equipment (balance weights and scales), as well as metrological systems used on Cyprus in the Late the Bronze Age. It seems that only Egyptian and Near Eastern metrological systems were adapted, while the Aegean system was not applied. It is striking because of wide trade and social contacts with the Aegean which existed already for many centuries and became particularly intensive in the Late Bronze Age. In addition, a relationship between metal production and weighing utensils, both canonical and uncanonical weights (potential stone weights) will be investigated.

05 **COMMUNITIES OF PRACTICE AND THE DEVELOPMENT OF BRONZE AGE WEIGHING**

Author(s): Schon, Robert (University of Arizona)

Presentation Format: Oral

Traditionally, the development and codification of standardized weights and measures has been seen as a state endeavor. By overseeing the implementation of standardized weights, for instance, states reduce transaction costs in multiple fields from tax collection to medium and long range commercial markets. They also maintain authority over these systems by housing the physical prototypes that define the standards. This model, however, does not explain every situation in which standardized measures emerge. This paper takes an alternative viewpoint and adopts a communities of practice approach to weights and weighing. Communities of practice are groups of people who are engaged in a common undertaking. Their norms emerge through the pursuit of specific goals within a given endeavor. In the case of Mediterranean Bronze Age commerce, I argue that certain systems of standardized weights were codified through common use, rather than governmental decree. These can be traced through the appearance of weight sets, similar in form and material as well as metrological system, that appear in a discrete spatial range at a given time. Examples include

hematite spondonoids and Aegean lead disks. I contend that the distribution of such sets reflect communities of practice and their agents in the exchange of commodities.

06 TRADING ACROSS THE DIVIDE: SURPLUS COMMODITY EXCHANGE AND THE ROLE OF MERCHANTS IN THE POSTPALATIAL ERA

Author(s): Pratt, Catherine (University of Western Ontario)

Presentation Format: Oral

Over the last few decades, one of the biggest debates among scholars of ancient Greece concerns what exactly happened to maritime trade and exchange after the Mycenaean palatial collapse. Based on recent evidence from vibrant postpalatial sites including Tiryns and Lefkandi, it is now becoming clear that at least some networks persisted while others were newly formed. One of the best ways to trace these exchange networks is by examining the production and distribution of large ceramic transport containers, once used to carry commodities such as olive oil and wine. Although these data are less robust than for the previous palatial era, it is nevertheless possible to see some meaningful patterns. Concerning the production of ceramic transport containers, we see the simultaneous abandonment of specialized, mass-produced containers (e.g. oval-mouthed amphoras and transport stirrup jars) in favor of vessels that are more flexibly produced and used (e.g. amphoras, jugs, and hydrias). In addition, what had once been an inter-regional and Aegean-wide trade in oil and wine during the palatial eras, shrank considerably in the postpalatial era and moved towards establishing local and regional networks. These patterns in production and exchange of olive oil and wine and their containers show that immediately after the upheavals at the end of the Bronze Age, surplus commodities were actively used in non-palatial contexts as people sought to reestablish or establish new values and hierarchies through multiple modes of exchange. In turn, these exchanges were facilitated by people like merchants and entrepreneurs who carried forward into the postpalatial era specialized knowledge of trade connections and interactions. By tracing the continuities and differences in the production and distribution of ceramic containers used for transporting surplus commodities from the Late Bronze Age to the Early Iron Age, we can understand better the roles of merchants over the long-term.

07 MODELING THE MYCENAEAN TRADE IN CERAMICS: COMPARING ALBANIA, ITALY, AND THE LEVANT

Author(s): Galaty, Michael (University of Michigan)

Presentation Format: Oral

This paper will consider the means whereby Mycenaean pottery reached sites in other regions outside the Mycenaean heartland. I compare the characteristics of exchange between Mycenaean Greece and three nearby, peripheral zones: Albania, Italy, and the Levant. In each case, there are differences in timing, intensity, and the final disposition of pots. I suggest that various different agents operating out of different Mycenaean states were responsible for the ceramics trade and, moreover, that they possessed very different motivations. In the case of Albania, trade in pottery piggy-backed on other forms of trade, of metals in particular, and was probably undertaken by merchants operating outside palatial control. In the case of Italy, trade in pottery may have occurred together with more formalized, sustained contact, and was likely organized by palatial authorities. Finally, in the case of the Levant, the pottery trade was centrally administered, probably by Mycenae, and was commercial in nature. Comparative analysis of different, regional Mycenaean ceramic exchange systems indicates that Mycenaean trade functioned along a continuum ranging from informal and anarchic to formal and highly administered. In all three cases, market forces were in operation and substantivist economic theory alone cannot explain the variability in regional trade patterns.

08 THE EVERYDAY MOVEMENT OF POTTERY IN THE LBA SARONIC GULF: A WINDOW ON LONG TERM PATTERNS OF PRODUCTION AND EXCHANGE?

Author(s): Day, Peter (Department of Archaeology, University of Sheffield) - Gilstrap, William (Center for Materials Research in Archaeology and Ethnology - CMRAE, Massachusetts Institute of Technology - MIT)

Presentation Format: Oral

In spite of our desire to see pottery vessels as indicators of everything from the workings of early states to markers of imagined household production, in some ways the ceramics themselves remain stubbornly consistent from the Neolithic onwards. In a picture which highlights the longevity of patterns emerging as early as the seventh millennium BCE in the Aegean, everyday pottery circulates in the multitude of regional worlds, perhaps reliant on long-consumed reputations and established patterns of distribution, often sea-borne and subsequently overland, aided by beasts of burden.

A major study of pottery from sites in and around the Saronic Gulf, Greece, has enabled a detailed picture of the movement of utilitarian pottery in LH IIIB, in the latest phases of the Mycenaean palatial system. Pottery from production centres, harbours, shrines and urban settlement moves along channels of distribution which may have existed long before the palaces and which seem to have outlived their demise. When this is compared to indications of the movement of pottery in the same area from the Neolithic and Early Bronze Age, there emerge long-term repeated patterns.

Pots move. In that they might not be unusual, but these remarkably resilient proxies for life offer huge potential to reconstruct the narratives of survival, of interaction and of consumption. The Saronic Gulf seen from many directions seems to be bounded on all sides by its islands and mainland coastline. If it appears like a lake which contains repeated patterns of movement, clearly aided by

merchants, it is one which is open to layers of interaction and movement from beyond its boundaries. We examine this continuum of movement, considering the longevity of social relations which underpin mechanisms of exchange.

09 FROM MERCHANTS (?) TO MIGRANTS - AEGINETAN POTTERS IN THE EUBOEAN GULF

Author(s): Lis, Bartłomiej (British School at Athens)

Presentation Format: Oral

Aeginetan cooking pottery has been widely exchanged within the Aegean (and even beyond) during the palatial Late Bronze Age. Despite ubiquitous imports of such pottery at a number of sites on the Greek Mainland, sometimes constituting as much as 50% of the entire cooking assemblage, we are still far from understanding how its distribution was organized. Were the potters responsible only for production, or were they (at least some of them) attempting to play a more active role in the distribution of their wares? Were there any independent merchants involved? Another important and closely related question is whether the production of Aeginetan cooking pottery and its subsequent export was in any way controlled by Mycenaean palaces, and if so, to what extent. In this paper, I will look at the diachronic changes in pottery production on Aegina, including the shapes and the use potmarks, as well as the distribution patterns in order to shed at least some light on these questions. What can be demonstrated with more certainty, however, is that shortly after the destruction of the Mycenaean palaces, some Aeginetan potters become mobile, and settled at a number of locations along the Euboean Gulf. Thus, they start acting more locally, producing cooking pots at sites that used to receive Aeginetan exports in quantity in the palatial period, perhaps in an attempt to overcome what has been missing – a well-organized distribution network. This activity did not prove successful, however, as such cooking pottery disappeared shortly after it was introduced on a local level in the Euboean Gulf.

201 RETHINKING TIME IN (CONTEMPORARY) ARCHAEOLOGICAL CONTEXT

Theme: Theories and methods in archaeological sciences

Organisers: Shay, Talia (Former Senior Lecturer, Israel Institute of Technology, Technion) - Pyrgaki, Marie (Hellenic Open University) - Malugani Guillet, Lilien (Universidad Nacional de Catamarca, Facultad de Humanidades)

Format: Regular session

Philosophers and social sciences when beginning their discussion about time, often call attention to the complexity of the task ahead of them. Time investigation has come today to the fore, especially the recent notion of “fluid time” reflecting the relations between the multidimensional process of time and the global capitalist system.

Taking our ideas from both philosophers and social scientists we are interested in the questions such as the following:

- Time depth is what gives archaeology its distinction as an intellectual discipline. Yet, how do archaeologists (traditional and contemporary) cope with the palimpsest nature of the material world they discover?

What is the nature of the boundary between “past” and “present”? How could we reconcile long term phenomena with the emphasis on individual action? Is “chronological” time that measures the unilinear sequence of events in archaeology a subjective measure?

- Time framework as a site of confrontation between the state and individual/Indigenous communities.

How does the control of time by modern national states that disregards individual community histories erases their identities? How do individual communities challenge time - control by the state and what are the measures they take to confront it?

- Time and religion

How do religious communities actualize the problem of temporality and what strategies do they take for constructing relationship of contemporary adherents with time?

Our purpose, therefore, is to investigate the various perspectives taken by the social sciences to approach the concept of time and we welcome papers elaborating on these topics.

ABSTRACTS

01 TIME AND ITS COMPLEXITY IN THE ARCHAEOLOGICAL CONTEXT

Author(s): Pyrgaki, Marie (Universite Paris I, Pantheon -Sorbonne; Hellenic Open University)

Presentation Format: Oral

This paper explore time one of the constitutive elements of archaeology. For many years, the concept of time in archaeology was regarded as a methodological issue that is about controlling the temporal dimension (Aitken 1990; Nash 2000). Only in the past two decades a theoretical literature on the concept of time has emerged within archaeology by a number of scholars addressed this topic (Bradley 1993; Murray 1999; Karlsson 2001; Lucas 2005; Holdaway & Wandsnider 2008; Robb & Pauketat 2013). Also, many studies deal with different aspects of temporality such as biography, memory, narrative, long-term history, non-linear systems and

the archaeological record (Hodder 1987; 1993; Moore 1995; Thomas 1996; Bradley 1998; 2002; Marshall & Gosden 1999; Holtorf 2002; Meskell 2005; Jones 2007; Bailey 2007; 2009; Boric 2009; Lucas 2015 et al.).

Further, time is involved and critiqued through dichotomies like linear/cyclical, continuity/change, past/present etc., which some philosophers (McTaggart 1908 et al.) have argued to be substantial to any conceptualization of time.

My purpose is to address the concept of time in archaeology that is strongly associated with change, drawing examples from the Greek archaeological record. Some scholars point out the idea of change in modernity (Tilley 1990); others assert that as archaeologists we study change (Harrison and Schofield 2010); others point out the transformation at least since the origins of the discipline at the beginning of the 19th century (Schnapp 1996); others document non-change, as things and material practices retain their function and social uses for millennia without great transformations (Leroi-Gourhan 1971).

In this paper we rethink about what is change from an archaeological perspective; if the archaeological record is a contemporary phenomenon and how it relate to the past; how a more critical stance toward time might offer new ways of conducting our research.

02 NEW IN CHRONOLOGY. WHY THE WESTERN BALTS?

Author(s): Shiroukhov, Roman (Zentrum für Baltische und Skandinavische Archäologie Stiftung Schleswig-Holsteinische Landesmuseum Schloss Gottorf)

Presentation Format: Oral

The conflict of relative and absolute chronologies is obvious; the opposition of archaeological “process” and historical “event”. How to correlate them?

The chronology of the East Baltic for the Roman-Migration Age (A-E periods) is widely accepted, despite the fact that Roman coins and other artefacts could be used for a much longer period of time, especially at the periphery. Our chronological approaches must be verified here through a combination of different dating methods.

The situation of the Late Iron Age of the East Baltic region is crucial. Most archaeologists date the sealed deposits, layers and sites by the “imports&analogies” method or by using only one natural-science method (14C). Radiocarbon dating with no connection to an elaborated typology, the spatial ordering of sites and statistical research, can hardly be used as the only foundation for establishing a local chronological pattern.

Archaeological sources for the Western Balts of the Late Iron Age in the Kaliningrad region of Russia and Western Lithuania represent a good chance for dating. The combination of imported goods with local artefacts within the same cremation graves gives the opportunity to compare their relative dating on the basis of existing chronological schemes.

The dense concentration of graves in cemeteries and their systematic research allows us to mark the relative dates gained throughout typological research on GIS maps and to verify this data through statistical methods. And after that it is possible to date the material from these relatively dated graves with 14C.

There are many questions remaining. The issue of the interaction of archaeological data and written records. The question of the incorporation of local chronologies into the chronology of the Baltic region and to the wider time-space-context. And lastly – how can we describe the theories of multi-temporality and discrete time through the archaeology of the Western Balts?

03 IMAGES AND TIME: CRITICAL IMAGES IN THE TREATMENT OF ARGENTINA'S INDIGENOUS PAST AND PRESENT

Author(s): Malugani Guillet, Lilén (Universidad Nacional de Catamarca, Argentina)

Presentation Format: Oral

The control of time by the state in Argentina was the reason why, during the last decades of the 19th century, indigenous identities were erased in the formation of the national state's citizenship. This justified the killing and disappearance of entire peoples; who could then be studied as remnants of a distant and buried past. The Indigenous Others had no coexistence with the archaeologists and travelling scientists and therefore were distanced from their “present”. All that the State decided to silence was done manipulating the Indigenous past at their convenience. It clearly affected the creation of museums and the State treatment of their history. This is happening here and now with the State repressive forces taking control of time in the Mapuche's resistance and fight for their rights. In order to research on time and the control of time by the state, we have to define and question what ‘contemporary’ actually means. We have to bring into question the nature and politics of time. The presentation will include photographs and images of the two moments. We are going to focus on them as registers of temporality defying the sequentialist dimension of time. We will work with the “anachronistic” or “heterochronic” readings of history proposed by Benjamin, Agamben and Didi-Huberman. This conception of an historical time, characterized by anachronisms and dialectical temporalities, breaks with Evolutionism and the Philosophy of Progress. We think of history no longer as fixed knowledge, but in its discontinuities and in the anachronisms of time that it entails. This idea of questioning time, history, progress, modernity and post modernity is in short a necessity to think time not as a homogeneous concept, but filled up with the presence of the present.

04 TIME AND NECROPOLITICS: HERITAGE-MAKING IN CONTEMPORARY SOUTHERN AFRICA

Author(s): Fredriksen, Per Ditlef (Department of Archaeology, Conservation and History, University of Oslo; Department of Archaeology, University of Cape Town)

Presentation Format: Oral

This paper will explore how an archaeological gaze at the material conditions of contemporary everyday life provides a distinctive ethnographic view when studying past human/thing dynamics and temporality. Drawing on my own recent fieldwork in South Africa and Zimbabwe, I centre on the relevance of the notion of necropolitics for understanding contemporary engagement with the past. I consider two overlapping and mutually informing research foci. The first is living/ancestral communication by material means, exploring how the materiality of the everyday relate to understandings of the human condition, death, containment of being, place and temporality. The second focus is engagements with clay and other soil substances, exploring ceramic technologies' relationship to the spatiality of built environments and agricultural landscapes. Seeking to demonstrate that ethnographic exploration of the temporality of human/thing entanglements can spiral reflection into novel and perhaps unforeseen domains, the paper will discuss processes of heritage-making through constant oscillations between the present and various pasts, particularly the common characteristic of venturing into the past in order to correct, improve or legitimise actions or events in the present. On this basis, I will relate to the question of how local communities may actualise challenges of temporality and the strategies employed in the construction of contemporary adherents with time.

05 THE CONTROL OVER TIME AND ITS ROLE IN THE ULTRA-RELIGIOUS ATTITUDE TOWARD DEATH

Author(s): Shay, Talia (Former Senior Lecturer, Israel Institute of Technology, Technion)

Presentation Format: Oral

Time investigation has come today to the fore, especially the notion of "fluid time" reflecting the relations between the multi-dynamical process of time and the global capitalist system. Time perception enables us to focus on phenomenological accounts in an age where nominalist predispositions reject all abstract ions and essentialisms of the past.

Focusing on time perception, I analyze an Ultra-Religious Israeli community which contrary to other Jewish or minority groups, refuses to exploit their dead in order to create symbolic "realms of memory" related to the historic time-span of the nation-state.

Following Kierkegaard, I argue that the Ultra-Religious attitude toward death depends on their consideration of the afterlife as a simple continuity of the present time, unlike Christianity which regards it as an absolutely transcendent realm above all time. The former attitude is founded in Jewish tradition, which considers death as a sacred domain and regards the dead as feeble who may feel pain and require the protection of the living. In accord with this tradition, the Ultra-Religious community, since the 19th century, took upon itself to protect the dead and antagonize to archaeological activities and to the removal of burials for reasons of public interest, conversely to other Jewish groups who may accept them.

In other words, the control over time plays an important role in the refusal of the Ultra-Religious community to exploit their dead in order to create "realms of memory" related to the time-span of the nation-state.

06 INDIGENOUS ONTOLOGIES OF TIME: TOWARDS A REMODELING OF WESTERN TIME CONCEPTS IN ARCHAEOLOGY

Author(s): Schmidt, Peter (University of Florida; University of Pretoria, South Africa)

Presentation Format: Oral

A recent view that engagement with other ontologies are insidious rather than informative empirical evidence is addressed in this paper. Such a view holds that engagements with non-Western ontologies (particularly those the impinge upon time) threaten conventional historical methods and protocols and that the incorporation of local conceptions within Western historical theories risks denigrating historians' authority. The notion of Western authority is quintessentially colonial as it asserts that our historical methods rest on rejection of any reality that conflicts with Western thought. By rejecting other ontologies, the West continues to erase historically important realities that may deeply inform how the archaeological record is formed. This exclusionary denial of other ontologies introduces confusion and doubt into attempts to learn from other time-space realities. This perspective also precludes serious consideration of how non-Western ontologies enter into how we--as archaeologists--negotiate different realities to arrive at plausible and inclusive interpretations. I argue that when alternative ontologies arise in the midst of our archaeological practice, we are compelled as part of our responsibility as archaeologists to account for their structuring of physical phenomena that relate directly to space-time issues. I illustrate why it is important to listen closely to alternative ontologies that structure space-time relationship, drawing on examples from multiple cultures in eastern Africa.

THEORETICAL APPROACHES TO TECHNO-BEHAVIOURS DURING THE MIDDLE STONE AGE (AFRICA)/MIDDLE PALAEO-LITHIC (EUROPE)

Theme: Theories and methods in archaeological sciences

Organisers: Högberg, Anders (Linnaeus University; University of Johannesburg) - Lombard, Marlize (University of Johannesburg) - Hovers, Erella (Institute of Archaeology, The Hebrew University of Jerusalem)

Format: Session with keynote presentation and discussion

Research results of the past decade or two shifted and enhanced our understanding of technology-related behaviours during the African Middle Stone Age and European Middle Palaeolithic. Novel interdisciplinary approaches have been introduced, leading to new knowledge about techno-behaviours prior to about 40 000 years ago. Theoretical approaches and broad regional interpretations, on the other hand, show more sluggish development. Empirical results, sometimes based on new techniques, are therefore often impressive and even surprising, but recurrently presented in the context of under-theorised interpretative frameworks.

In this session we aim to interweave African and European theoretical concepts by presenting papers that explore the integration of techno-behavioural approaches with theoretical curiosity. In particular, we invite papers that include discussion on the following topics: How can we expand existing theoretical approaches to understand techno-behaviours during the Middle Stone Age and/or Middle Palaeolithic? What theoretical approaches are needed to develop new, in-depth understandings about the people who lived during these time periods? What interpretative perspectives on material culture studies are needed to bridge scientific and technological approaches with theory?

ABSTRACTS

01 INTRODUCTION TO THE SESSION

Author(s): Lombard, Marlize (University of Johannesburg) - Högberg, Anders (Linnaeus University; University of Johannesburg)

Presentation Format: Oral

The period in focus for this session is arguably one of the most interesting in human history. It represents the time when the Neanderthals lived in Eurasia, contemporaneously with modern *Homo sapiens* in Africa starting to wander beyond the boundaries of that continent. What is more, it seems that we also shared our landscape with species that were very different from us and the archaic humans. For example, in southern Africa the small-brained *Homo naledi* is thought to have lived during the Middle Stone Age, whereas previously, it was accepted that archaic or modern humans were the only hominin survivors in that region at the time.

The middle Stone Age/Middle Palaeolithic is also the time during which we see a florescence in symbolic, cognitively and technologically complex behaviours in different Old World populations (archaic and modern). It is therefore clear that local and regional geo-archaeological records are more multidimensional than previously thought.

With this short introduction we briefly unpack the current need for the renewal and/or revision of theoretical frameworks for the interpretation of Middle Palaeolithic/Middle Stone Age behaviours associated with material culture, set against the progress of empirical work associated with both the African and European records.

We will also introduce the keynote speaker and discussant to the audience, and explain the format of our session.

02 GETTING A HANDLE ON TECHNOLOGICAL CHANGE

Author(s): Barham, Lawrence (University of Liverpool)

Presentation Format: Oral

We are living through a period of unprecedented technological change in terms of its speed, reach and societal impact. The digital or 'Fourth Industrial Revolution' affects us all, and as observers as well as participants in this revolution we can and should make use of it to study long-term processes of technological change.

This talk draws on the work of complexity theorist W.B. Arthur (2009: *The Nature of Technological Change*) to explore the transition to the Middle Stone Age/ Middle Palaeolithic in terms of its technological, cognitive and social foundations. Arthur highlights the combinatorial property of all modern technologies which results in self-generating systems of increasing complexity with disruptive consequences for older technologies and their makers. The case will be made that invention of hafting in the Middle Pleistocene marks the first combinatorial technology.

Hafting was conceptually new and drew on existing knowledge of hierarchical technologies including those which brought organic and inorganic materials together. These 'integrative technologies' are found in the Acheulean of Africa and Eurasia (Barham 2013). Just as experimental archaeology is now providing insights into the cognitive and biomechanical impacts of this new technology, we as archaeologists can use the archaeological record to chart its disruptions and transformations.

The approach taken here is uniformitarian, whereby we use evidence from the present to frame an understanding of the past – or to paraphrase Donald Rumsfeld, using known knowns to understand unknowns.

Bibliography

Arthur, W.B. 2009. *The Nature of Technology*. London: Allen Lane

Barham, L. 2013. *From Hand to Handle: The First Industrial Revolution*. Oxford: Oxford University Press.

03 PLAY OBJECTS AND OBJECT PLAY: THEORETICAL AND METHODOLOGICAL ASPECTS OF STUDYING THEIR SIGNIFICANCE IN HUMAN CULTURAL EVOLUTION.

Author(s): Johannsen, Niels - Riede, Felix (Department of Archaeology and Heritage Studies, Aarhus University; Interacting Minds Centre, Aarhus University) - Högberg, Anders (Department of Cultural Sciences, Linnaeus University, Faculty of Arts and Humanities; Stellenbosch Institute for Advanced Study - STIAS, Wallenberg Research Centre at Stellenbosch University) - Nowell, April (Department of Anthropology, University of Victoria) - Lombard, Marlize (Centre for Anthropological Research and Department of Anthropology and Development Studies, University of Johannesburg; Stellenbosch Institute for Advanced Study - STIAS, Wallenberg Research Centre at Stellenbosch University)

Presentation Format: Oral

We suggest that play objects and object play are significant factors to include when addressing a major puzzle in the evolution of human material culture: If maturing individuals just learn their parental generation's material culture, then what is the origin of key innovations as documented in the archaeological record? We approach this question by coupling a life-history model of the costs and benefits of experimentation with a niche-construction perspective. Niche-construction theory suggests that the behaviour of organisms and their modification of the world around them have important evolutionary ramifications by altering developmental settings and selection pressures. Part of *Homo sapiens*' niche is the active provisioning of children with play objects — sometimes functional miniatures of adult tools — and the encouragement of object play, such as playful knapping with stones. Our model suggests that salient material culture innovation may occur or be primed in a late childhood or adolescence sweet spot when cognitive and physical abilities are sufficiently mature but before the full onset of the concerns and costs associated with reproduction. We evaluate the model against a series of archaeological cases and link our suggestions to related, current research efforts. In particular, we focus on theoretical and methodological challenges in and resources for studying play objects and object play in various parts of the Stone Age.

04 EXPLORE THE UNIVERSE! TOWARDS PROCESS-ORIENTED APPROACHES TO STUDY TOOL-USE

Author(s): Noel Haidle, Miriam (Institut für Ur- und Frühgeschichte des Mittelalter)

Presentation Format: Oral

Focusing on a workpiece – its manufacture, use and discard –, technological analyses are commonly neither laid out for in-depth comparative studies, nor for broader theoretical integration. They are not considering humans as actors with a certain target and the tool as a means to gain it; and they are not taking the development of a behavior into account, be it of an individual (by social and material engagement) or within a group (by invention and innovation). Nevertheless, technological analyses represent an important starting point for more comprehensive studies, if they are integrated into process-oriented approaches. Basis is a systematic coding of the reconstruction of the handling of a tool, for example in cognigrams and effective chains, with consideration of the actor(s) involved and the broader conditions of the tool's appearance. These and possible alternative reconstructions allow for a more precise assessment of similarities and differences between behaviors. This is a prerequisite for the better understanding of the innovative content of a behavior, of the individual learning and traditioning involved to maintain it on a certain level, and of its preconditions and consequences. To link theoretical approaches of cultural and cognitive evolution to techno-behaviours, the universe of those behaviours has to be explored. An example will show difficulties and potentials of process-oriented approaches.

05 NEUROMARKETING AND MIDDLE STONE AGE: ATTENTION AND EMOTION IN HANDLING TOOLS

Author(s): Fedato, Annapaola (Centro Nacional de Investigación sobre la Evolución Humana, Burgos) - Silva-Gago, María (Universidad de Burgos, Burgos) - Alonso-Alcalde, Rodrigo (Museo de la Evolución Humana, Burgos) - Terradillos-Bernal, Marcos (Universidad Internacional Isabel I de Castilla, Burgos) - Fernández-Durantes, María Ángeles - Martín-Guerra, Elena (Sociograph Marketing Science Consulting, Valladolid) - Bruner, Emiliano (Centro Nacional de Investigación sobre la Evolución Humana, Burgos)

Presentation Format: Oral

Cognitive archaeology deals with behavioral inference based on archaeological record. Paleoneurological evidence suggested specialized visuospatial brain areas in modern humans, when compared with extinct human species. Visuospatial functions include body-environment and eye-hand-tool integration, visual imaging, simulation, and body cognition. In extinct populations, visuospatial behaviors can be investigated through information provided by lithic technology, skeletal biology, and ecology. Here, we propose methods used in neuromarketing to quantify some aspects of the haptic experience when handling traditional lithic tools. These methods are based on electrodermal measurements, and can be used during behavioral performances through remote devices. Two main aspects concern emotional involvement and attention levels. We tested electrodermal variables in a sample of adult individuals while handling Early and Middle Stone Age stone tools. Subjects were blindfolded as to evaluate whether the hand-tool experience can influence emotional conditions only as a consequence of the physical interaction. Result suggests differences between males and females, and between distinct tools. These approaches supply an additional perspective to link archaeological artifacts with cognitive responses. Results are relevant to make inferences of possible changes along the archaeological record, but also to evaluate to what extent tools can influence our cognitive processes, by virtue of their properties (haptic affordance). This approach

can be further interpreted within general hypotheses on cognitive extension.

06 CAN TECHNOLOGICAL APPROACHES OF MIDDLE STONE AGE POINTED INDUSTRIES ENHANCE THEORETICAL FRAMES?

Author(s): Douze, Katja (Université de Genève)

Presentation Format: Oral

Theoretical approaches on Middle Stone Age have largely been dominated by a search for evidences of the development of a modern mind among Homo sapiens populations. This has profoundly affected our evaluations of technology-related behaviours and consequently, our interpretations of Middle Stone Age societies. In this regard, lithic pointed productions, which are the main cultural markers of the period, have suffered over-interpretations with little in depth technological assessment, and even less comprehensive use-wear analyses. Points are largely considered hunting devices as complex hunting practices have to be demonstrated to serve theoretical frames supporting emerging behavioural modernity. Here, we attempt a different approach based on several examples from different parts of Africa, aiming at reconsidering pointed industries through a technological angle in relation with their morphology. This leads to a more varied panel of interpretation of pointed tools, that includes their function as hunting weapon, but that does not encapsulate all pointed morphologies into a unique functional category. Such different approaches that do not conform to oriented theoretical frames are currently developed by a handful of researchers in Africa and have the potential to enhance our understanding of Middle Stone Age populations, their capacity to adapt, retract, innovate, interact and develop.

07 KNOWLEDGE TRANSFER SYSTEMS REFLECTED IN KNAPPING: THE STILL BAY TECHNOCOMPLEX AS A CASE IN POINT

Author(s): Högberg, Anders (Linnaeus University; University of Johannesburg) - Lombard, Marlize (University of Johannesburg)

Presentation Format: Oral

The transfer of knowledge can be defined as a process through which one social unit – an individual, group or community – is impacted on by the experience of another unit. With knowledge-transfer systems we here refer to processes of inter- and intra-generational social learning and how teaching and learning is organised in societies.

In this paper we focus on toolmaker performances, first by looking at children playing at knapping, and then by comparing point-production strategies in the Still Bay technocomplex, that occurs in southern Africa during the later stages of the Middle Stone Age at roughly 80-70 ka. The archaeological record from this time contains multiple lines of evidence that indicate enhanced cognitive and behavioural trends that are comparable to those of humans today.

By elaborating on potential variability in knowledge-transfer systems our aim is to broaden current theoretical approaches to understand techno-behaviours during the Middle Stone Age. We propose a blend of knowledge-transfer systems during the Still Bay phase. According to this model, groups shared and adopted some elements of their approaches to point-knapping across southernmost Africa, while certain knapping conventions, however, became localised or were locally invented. We are not yet able to explain fully the underlying mechanisms for the observed variability in point-production strategies. However, we suggest that both inter- and intra-regional knowledge-transfer systems operated within the context of a flexible approach to Still Bay point knapping, adapted to the needs of a specific group/s and/or individuals in their specific socio-economic and ecological environments.

08 BIFACIAL PIECES IN WEST AFRICA: THE NEW DATA BETWEEN THEORY AND REALITY

Author(s): Lorenzo Martínez, María (Laboratoire d'Archéologie et Peuplement de l'Afrique, Département Génétique et Évolution, University of Geneva) - Davidoux, Sarah (Laboratoire de géographie physique, CNRS, UMR8591, University Paris-Est Créteil Val-de-Marne; University Paris I - Panthéon-Sorbonne) - Garnier, Aline (Laboratoire de géographie physique, CNRS, UMR8591, University Paris-Est Créteil Val-de-Marne) - Lebrun, Brice (IRAMAT-CRP2A, University Bordeaux Montaigne) - Lespez, Laurent (UMR 6554 CNRS LETG; Laboratoire de géographie physique, CNRS, UMR8591, University Paris-Est Créteil Val-de-Marne) - Rasse, Michel (Environnements et sociétés de l'Orient ancien - ARCHEORIENT, CNRS, UMR5133, University Lumi?re - Lyon II) - Douze, Katja - Huysecom, Eric (Laboratoire d'Archéologie et Peuplement de l'Afrique, Département Génétique et Évolution, University of Geneva)

Presentation Format: Oral

Bifacial points are widespread tools over the northern half of the African continent during the Middle Stone Age. They are common components in the lithic industries, but are not often the subject of a specific interdisciplinary study associating functional technology, typology and traceology, and environmental contextualization. Such comprehensive studies are incomplete and infrequent. Although the South African lithic series are very well known and benefit from optimal studies, this is not the case in other parts of the continent. Due to lack of knowledge, comparisons on a very large temporal and geographical scale are attempted. The result is theoretical concepts in bifacial points technology for the Middle Stone Age.

Expanding from the results obtained at Ounjougou in Mali, recent excavations in the Falémé Valley in Eastern Senegal have revealed many new bifacial pieces in well dated and stratified sites within a multidisciplinary study. This talk will present the new results and will shed new light on the West African industries with bifacial points during the Middle Stone Age. In our opinion, they constitute regionally specific industries. During the discussion, we will explore the facies value of these bifacial industries, by (re)evaluating the representation of bifacial pieces in the pan-African context.

09 LONG GONE WILDS OR NOVEL POSSIBILITIES?

Author(s): Basell, Laura (Queen's University Belfast; Prehistoric Society)

Presentation Format: Oral

Recent developments in geochronology have been critical in facilitating the integration of different data sources, and in changing our understanding of when different species emerge and the degree to which they overlap in time and space. It could be argued that due to such scientific advances we are better positioned than ever before to understand behavioural change in its broader landscape, palaeoecological and genetic context. The plethora of new discoveries in recent years has led to significant shifts in long-accepted interpretations, which is undoubtedly exciting and makes us re-evaluate the questions we ask for these periods of human evolution. But alongside this, the diversification of disciplines and methods being brought to bear on the subject of human evolution makes it increasingly challenging to produce new "grand narratives". At the heart of these matters lies the issue of scale; and the fact that the many of lifeways, landscapes and faunas we seek to understand have no analogue in today's world or the more recent past.

This paper will consider the limitations and possibilities of understanding life in the Stone Age. It will focus on recent methodologies and theoretical approaches that facilitate the exploration of human behaviour, technological and landscape change and importantly, consider those which allow researchers to move between scales and across disciplines. Case studies will include site-specific and regional considerations of Early – Middle Stone Age sites in Uganda and Tanzania in the context of our current understanding of the emergence of *Homo sapiens*; as well as regional and landscape analyses of the European Palaeolithic.

10 BRIDGING STATISTICAL AND ARCHAEOLOGICAL SIGNIFICANCE IN MIDDLE PALAEOLITHIC ARTEFACT DESIGN STUDIES

Author(s): Hoggard, Christian (Department of Archaeology and Heritage Studies, Aarhus University) - Stade, Cory (Centre for the Archaeology of Human Origins, University of Southampton)

Presentation Format: Oral

A signature component of the European Middle Palaeolithic is the technological flexibility of past Neanderthal societies, with a variety of different raw material morphologies and core volume-management strategies utilised for the production and subsequent transformation of specific artefact blank types. These resulting blank-types may feature different blank morphologies, which can be viewed as having improved 'performance characteristics' (Skibo and Schiffer, 2008). However, while many studies of artefact design test hypotheses are based on 'intent' and highlight the functional implications of blank morphologies (Eren and Lycett, 2016; Hoggard, 2017), how do we further strengthen the behavioural chain between the perceived functional advantages of lithic types and the activities, interactions and technical choices made by past hunter-gatherer societies? How can we confidently scale these interpretations up to broad regional behaviours, and answer aspects of technological lifestyles exhibited in Middle Palaeolithic technological variability? Moreover, how do we address the fluidity of technological behaviour, the exceptions to rules?

This presentation will discuss these ideas with reference to technological blade strategies, and their temporal relationship throughout the European Middle Palaeolithic. Through an examination of artefact design, various 'performance characteristics' were noted, including edge-angle and the amount of cutting. So, in light of the above points, how do we extend the perceived statistical significance to become of archaeological significance?

Eren, M.I. and Lycett, S.J. (2016). A statistical examination of flake edge angles produced during experimental lineal Levallois reductions and consideration of their functional implications. *Journal of Archaeological Method and Theory* 23 (1): 379-398.

Hoggard, C.S. (2017). Considering the function of Middle Palaeolithic blade technologies through an examination of experimental blade edge angles. *Journal of Archaeological Science: Reports* 16: 233-239.

Skibo, J.M. and Schiffer, M. (2008). *People and Things: A Behavioural Approach to Material Culture*. Springer Publishing.

11 HOMO NALEDI IN THE MIDDLE PLEISTOCENE: AN ARCHAEOLOGICAL PERSPECTIVE

Author(s): Dusseldorp, Gerrit (Leiden University; University of Johannesburg) - Lombard, Marlize (University of Johannesburg)

Presentation Format: Oral

A small-brained species of hominin, *Homo naledi* was discovered in the Cradle of Humankind World Heritage Site. It was recently determined to date to the Middle Pleistocene, in contrast with previous suggestions for a much older age. Its date demonstrates that *H. naledi* co-existed with larger-brained hominins in South Africa's central interior. Moreover, it is contemporary with the beginning of the Middle Stone Age in the region (characterized by prepared core or mode 3 assemblages). In light of this, its discoverers have explicitly cast it as a potential producer of Middle Stone Age technologies (Berger et al. 2017).

We develop a hypothesis on the ecological and technological niche *Homo naledi* likely occupied. We briefly review relevant elements *H. naledi*'s anatomy and their implications for its ecology. We provide an overview of the characteristics of the South African archaeological record contemporary with *H. naledi*.

We reason from the principle of competitive exclusion and suggest a technological repertoire consisting of simple cores and flakes functioning in a niche focusing on extracted foods is most likely for *Homo naledi*. We contend that prepared core assemblages were associated with larger-brained populations, fossil remains of which are also known from South Africa's central interior.

Berger, L.R., Hawks, J., Dirks, P.H.G.M., Elliott, M., Roberts, E.M. (2017). Homo naledi and Pleistocene hominin evolution in subequatorial Africa. *eLife*, 6, e24234.

12 GEARING THE CHAÎNE OPÉRATOIRE APPROACH TOWARD RECONSTRUCTING THE NATURE OF THE INTERACTIONS BETWEEN FOSSIL HOMININS

Author(s): Soressi, Marie (Leiden University)

Presentation Format: Oral

DNA and morphological analysis have shown that diverse fossil hominin groups exchanged genes and in turn must have interacted. However, how frequent were these interactions, what else than genes people exchanged and where interactions happened and – in other words how much socially intimate people belonging to different groups were – can't be reconstructed using biological techniques. Here I will explore how a chaîne opératoire analysis used in conjunction with a tailored taskcape visibility theoretical framework and applied to diverse set of material culture can powerfully contribute reconstructing the nature of interactions between fossil hominins. Such a discussion will be built upon the middle-range theory developed by Tostevin (2011) and will use the site of Quinçay, France, as researched by Roussel et al (2016) as a test-case.

In the later paper, we suggested that late Neandertals at Quinçay cave were in superficial contacts with early modern humans present in the area. Material culture found at Quinçay is classified as Chatelperronian and considered a late Neandertal production (Soressi and Roussel, 2014; Welker et al. 2016). At Quinçay were found retouched bladelets that are mimicking the form of retouched bladelet usually found in the Protoaurignacian, thought to be the testimony of the first modern human settlements in the area. Considering that 1. Quinçay bladelets weren't produced using a Protoaurignacian method but a Chatelperronian one, 2. There are several ways of retouching a bladelet, and 3. Only one is known in the area for the Protoaurignacian (Falcucci et al 2017), we suggested Chatelperronian knappers got the idea of manufacturing such bladelets while being in superficial contacts with the Protoaurignacians, maybe by finding such bladelets – often used as projectile tips- lost abandoned in the landscape. This is suggesting that the two populations in the Quinçay area were not socially intimate or were conservative.

208 TO YOUR HEALTH! TRACING HEALTH IN URBAN ENVIRONMENTS IN MEDIEVAL NORTHERN EUROPE

Theme: Theories and methods in archaeological sciences

Organisers: Christophersen, Axel (NTNU University Museum, Institute for Archaeology and Cultural history) - Kjellberg, Joackim (Uppsala University, Department of Archaeology and Ancient History)

Format: Regular session

Although inhabitants of Northern European medieval towns conceived of and knew about disease and “not being healthy” in ways other than ours, similar health risk factors were at play, such as poverty, lifestyle, environment, mobility and gender differences. Health and the physical environment, including climate, nutrition, diet and mobility, are linked together by complex cultural and social practices which constituted “urbanity” or the dynamics of medieval urban living for the most part. These processes can be advantageously analyzed and explained by using social practice theory. There is considerable potential to come to a more in-depth understanding of the relationship between the advancement of public health and the physical factors that played a fundamental role in the development of the ‘medieval urban way of life’.

New and improved methods in genetics, physics, paleometereology, archaeo-osteology, paleobotany, parasitology, archeo-zoology, histotaphonomy, high-density dating, etc. offer entirely new avenues to extract health- and environment meaning both from skeletal and conventional archaeological sources. This untapped source provides profound new insights into the overall health of urban communities and shows how particular environmental elements in the urban landscape are linked to external factors, such as climate, nutrition, mobility and dietary practices. The session will be organized by a cooperative effort of the ‘Enescoping-projekt’, ongoing large scale urban excavations in the town of Enköping, Sweden, and the NFR founded project ‘Medieval Urban Health AD 1000–1600. It will comprise 9 invited scholars from Norway, Sweden, Denmark and the Netherlands and will be open to all conference participants.

ABSTRACTS

01 MEDIEVAL URBAN HEALTH – A MATTER OF SOCIAL PRACTICE DEVELOPMENT. AN INTRODUCTION

Author(s): Christophersen, Axel (Norwegian University of Sciences and Technology, University Museum)

Presentation Format: Oral

Living in a medieval town was a challenge to health and welfare: To cope with infectious and contagious diseases, rheumatism or a bad health caused by environmental and malnutrition were deeply rooted in most people's daily routines. Because health, in all its diversity, was a mayor part of people's every day, we need to increase our insight into the types and frequencies of diseases and their causes in order to better conceive medieval urban life. An overall research goal is to investigate how internal and external

factors at different times affected the urban health situation in terms of built environment/housing condition, climate, nutrition, contamination and movements/migration. Social practices are a key factor to comprehend what diseases and how they spread, and/or restrict: Individual and public health status at any time is conditioned by social practices which appear, lives and dies in particular constellations of intentions ("projects), knowledge/insights/experience and materials. To understand how social practice patterns facilitates and/or counteracts sickness it is necessary to reveal and analyze the structures of social practice patterns in order to decide 1) which diseases appears at what time and with what frequency, 2) the various physical environmental factors implicated, and 3) what relations occurs between diseases and environmental impact factors. These challenges calls upon a cross-disciplinary approach and use of the latest techniques in aDNA and isotope analysis as well as new and improved methods in paleometereology, archaeo-osteology, paleobotany, parasitology, archeo-zoology, histotaphonomy, high-density dating, etc. which offer entirely new avenues to extract health- and environment meaning both from skeletal and conventional archaeological sources. These untapped sources are able to provide profound new insights into the overall health of urban communities and shows how particular environmental elements in the urban landscape are linked to external factors, such as climate, nutrition, mobility and dietary practices.

02 INVESTIGATING HEALTH STRATEGIES AND LIVING CONDITIONS IN THE ENESCOPINGE PROJECT. METHODS AND AIMS FOR A NEW PERSPECTIVE IN URBAN EXCAVATIONS

Author(s): Kjellberg, Joakim (Department of Archaeology and Ancient History; County museum of Uppland) - Bäck, Mathias (National museum of History, Archa)

Presentation Format: Oral

This presentation addresses the methodological and theoretical challenges as well as experiences in working with matters of health, sanitation, water and waste in the Enescopinge-project. It will also point to linkages between the project and other research on health in archaeology from classical to early modern Europe and beyond.

The Enescopinge project is a large scale contract archaeological excavation in 2017 and 2018 of a built up area in the medieval town of Enköping in central Sweden. One of the initial conditions and highlighted research themes was to investigate health strategies and living conditions over time. According to the initial results from 2017 we have at the start of the settlement in early 12th century a shore bound settlement and a harbor area. By the 16th century, due to shore displacement and overall urban development, it was located next to the main square of the town. This indicates that we will have to document and interpret changing social settings and urban functions within the excavated area, each with their own different strategies for handling diseases, waste, risk and health.

Since health traditionally has been studied by biological archeologists and mainly read from skeletal remains the challenge was to incorporate a focus on health in the overall documentation of an built up urban area of plots, streets and houses. In the process we now find that the project has been enriched and that we have found a novel approach for Swedish urban archaeology to take onto the repertoire for the future. Moreover there are still a lot of things to be developed a real need for further discussion with a broader field of contract archaeologists and scholars is evident.

03 DIET, SOCIAL COMPLEXITY AND HEALTH IN EARLY MEDIEVAL OSLO – HEALTH AND URBANIZATION THROUGH THE EXPERIENCE OF PEOPLE

Author(s): Naumann, Elise (NIKU - Norwegian Institute for Cultural Heritage Research) - Glørstad, Ann Zanette T. (Museum of Cultural History, University of Oslo) - Breiby, Martine P. (Dep. for Archaeology, Conservation and History, University of Oslo) - Mills, Ryan D. - Ful-lagar, Paul D. (Dep. of Geological Science, University of North Carolina)

Presentation Format: Oral

Diet and health are, and have always been, closely correlated. Diet and dietary variation depends on available resources, and thus place of residence and mobility, climate, and a complex set of socially embedded strategies for distribution of different foods. Daily occupation, status, sex, age, family connections, among other aspects, played a crucial role for everyday consumption. Would a local fisherman be more inclined to eat fish, compared to a local pig-farmer? Would different activities performed by men and women cause a difference in diet and health? How was distribution of foods between socially diverse subpopulation groups affected in times of shortage? What impact did diet have on health and nutrition during childhood?

In a recent study in collaboration between the University of Oslo, Museum of Cultural History, the Norwegian Institute of Cultural Heritage Research and the University of North Carolina, we investigated these topics through an isotopic study of human remains buried in Oslo during the first phase of urbanization around AD 1000. We have performed isotope analyses on human remains from 20 women, men and children buried during the first period of urban settlement in Oslo. Through detailed sampling representing different periods of individual lives, we have been able to study the chronological development of dietary practice and geographic movement for these 20 individuals. Some of the individuals were quite old, and were likely born before the town of Oslo was established. Results from isotope analyses thus provide a chronology of dietary practice during the period of initial urbanization. The research questions outlined in this abstract are approached through the individual life histories of people that experienced – and constituted – the very transformation to early urban way of living in Norway. In this paper we will outline and discuss some of our main findings.

04 LIFE IN MEDIEVAL CAMBRIDGE: DEMONSTRATING THE BENEFITS OF A WHOLE CITY APPROACH

Author(s): Inskip, Sarah - Robb, John - Dittmar, Jenna - Mitchell, Piers - Rose, Alice - O'Connell, Tamsin (University of Cambridge) - Scheib, Freddi (Estonian Biocenter, University of Tartu) - Kivisild, Toomas - Mulder, Bram - Stock, Jay (University of Cambridge)

Presentation Format: Oral

Cities and towns are complex places that exist and are maintained by various people and groups from within and around their landscape. Disease presence in these communities is related to certain risk factors, such as status, gender, lifestyle, and environment, which are not uniformly experienced by a population. As such, it is likely that groups within and around cities had differing experiences of disease. However, at present, many studies of health rely heavily on the analysis of data from parish cemeteries, with them being viewed as the most representative sample of the 'normal population'. This, combined with a tendency to use sample averages, creates a rather one-dimensional picture of disease which not only fails to fully explore the relationship between disease presence and risk variables, but is also unsuccessful in highlighting the varied lived experiences in these places. By taking into consideration the heterogeneous nature of towns and cities and moving beyond simple averages, this paper aims to demonstrate how a whole town approach, which considers multiple sites, can produce a better understanding of the role of risk factors in disease presence. More importantly, it can yield a more nuanced picture of the lived experiences of medieval people connected to urban environments. This is demonstrated through a multidisciplinary analysis of five different sites from Medieval Cambridge, including the Hospital of St John the Evangelist, the Augustinian Friars, the urban parish of All Saints by the Castle, and the rural parishes of Clopton and Cherry Hinton.

05 WAS DEATH THE GREAT LEVELER? THE DISTRIBUTION OF SANITARY INFRASTRUCTURE, SOCIAL WEALTH AND DEATHS DUE TO EPIDEMICS IN NINETEENTH-CENTURY LEIDEN

Author(s): van Oosten, Roos (Leiden University)

Presentation Format: Oral

In the nineteenth century, doctors began to notice a causal relation between living in urban slums and dying of cholera. Dr John Snow (1813-1858) noticed during the outbreak of cholera in 1854 in London that this relation was more specific. Only people who had consumed water from the Broadstreet pump became infected. To make his case that cholera was a waterborne disease, he plotted the location of all the victims on a geographical map. An obvious pattern emerged: the closer to the pump, the higher the number of victims.

The local health committee of Leiden produced similar detailed medical-topographic maps of outbreaks of cholera, typhus and scarlet fever in Leiden. The number of deaths by cholera and typhus per household are shown on a map. However, historians have neglected these sources in tracing the relationship between disease and economic status. By adding a third factor—sanitary infrastructure such as pumps and cisterns uncovered in archeology and historical sources—the question is raised whether a strong concentration similar to that discovered around the Broadstreet pump can also be seen in GIS analyses.

In short, this presentation is about the distribution of sanitary infrastructure, social wealth and deaths due to epidemics in nineteenth-century Leiden.

06 PEOPLE, PLOTS, PLAGUES. RESULTS AND EMPIRICAL OBSERVATIONS OF MEDIEVAL HEALTH FROM A LARGE SCALE URBAN EXCAVATION IN CENTRAL ENKÖPING, SWEDEN

Author(s): Sunding, Emelie (Upplandsmuseet) - Westberg, Tomas (The Archaeologists; National Historical Museums)

Presentation Format: Oral

During 2017 and 2018 a large scale excavation in the central parts of the town Enköping was undertaken by archaeologists from National Historical Museums and Upplandsmuseet. One of our main research themes has been aspects of medieval urban health and how these can be observed in the archaeological record. This paper will present the preliminary results and our reflections on health and living conditions of the medieval townspeople of Enköping.

Aspects of medieval urban health can be studied in various ways and from different perspectives. Health can infer both the physical environment as well as the physical and mental aspects of urban contexts.

Studies of diet, economics and parasites as well as waste disposal, hygiene and access to medicinal plants provide an insight into the health of the individual as well as the health of the group. Aspects such as access to clean water, overcrowding and the presence of pests can offer an insight into risks of infection. Crafts and labour which can be traced in the archaeological material can give us an understanding of possible repetitive strain injuries and physical damage within the group.

Medieval human health and urban habitats can be seen both through material culture and physical surroundings. Examples are artefacts that can be directly or indirectly associated with health strategies and how the organization of plots would affect people living there.

07 PARASITIC DISEASE AND HERBALISM. MACRO- AND MICRO PERSPECTIVES ON HEALTH AND ENVIRONMENT IN MEDIEVAL ENKÖPING

Author(s): Bergman, Jonas - Heimdahl, Jens (The Archaeologists; National Historical Museums)

Presentation Format: Oral

In the confined space and cramped conditions of a medieval town, sanitation, waste management, and consequently good health, was a challenge. The difficulties concerning diseases are highlighted by finds of several types of intestinal parasites. These were a major contributor to health problems both among people and livestock during medieval times, but they were far from the only type of illness that plagued the town. During excavations in the medieval town of Enköping, Sweden, macro- and microscopic analyses are performed continuously on medieval deposits from streets, ditches, townhouses, outhouses, stables and wells. One focus of those analyses is studying the archaeoparasitology of humans and livestock, and the use of medical herbs which may give new insights in contemporary illness and medical treatments. The botanical material of Enköping includes a number of plants cultivated for its medical purposes. One example is a rich and regular occurrence of Motherwort (*Leonorus cardiaca* L.), which suggests that it occurred as a weed, but probably originated from regular local cultivations. Motherwort seems to be one of the most common medical herbs in cultivation around medieval towns in Sweden, although it is not mentioned in local written sources as a medical plant until the 17th century. New finds reveals this plant as used during childbirth in medieval Sweden, which suggest a distribution and cultivation of medical herbs through midwives and women with knowledge of childbirth.

a. FEEDING THE POOR AND THE SICK, THE EVIDENCE OF THE HÔTEL-DIEU OF VALENCIENNES (15TH - 18TH CENTURIES)

Author(s): Derreumaux, Marie (CRAVO) - Oueslati, Tarek (CNRS) - Delassus, David (Service Archéologique de la ville de Valenciennes)

Presentation Format: Poster

The botanical macroremains and fauna from two latrines of the Hôtel-Dieu of Valenciennes have been studied. The first latrine, dated from the 15th century was dedicated to the patients ward at a time when the Hôtel-Dieu was already, taking care more exclusively of the sick, instead of the poor people. The second latrine dated from the end of the 17th and the beginning of the 18th centuries stand under the former brewery reconverted into housing. At this period, the Hôtel-Dieu was a military hospital but still hosted civilians. The archaeobotanical analysis reveals a rich and high quality plant based diet. It changes between the two periods, as spices became less important while vegetables got more numerous. The fruits spectrum also vary as the main fruit during the 15th c. -fig and strawberry- are replaced during the early modern times by red current, apples and pears. Except henbane and thyme, no medicinal plant has been found. Meat resources at the 15th c. relied mainly on beef and sheep whereas pork which was the most sought after meat is not abundant. The presence of veal, chicken and fish is to be noted. The consumption of fish relies on medium sized fishes such as plaice, sole and herring and on small fresh water fish probably fried and including gudgeon, loach and burbot. At the end of the 17th beginning of the 18th c, rabbit and hare are new comers in the diet and this is also the case for cod and haddock. Data from contemporary archives from Douai indicate that hospitals had an independent provisioning with annuities including grain and meat. Besides, one must indicate that inequality prevailed among the diet of the sick, the staff, and the administrators and the cesspits might give a variety of the diets within the hospital.

211 ROCK & RITUAL: CAVES, SHELTERS AND STONES IN THE ANCIENT MEDITERRANEAN

Theme: Mediterranean seascapes

Organisers: Machause López, Sonia (Universitat de València) - Grau Mira, Ignasi (Universitat d'Alacant) - Roure, Réjane (Université Paul Valéry - Montpellier III; UMR 5140 «Archéologie des sociétés méditerranéennes») - Rueda Galán, Carmen (Universidad de Jaén)

Format: Regular session

Rituals can take place in numerous scenarios. Some natural places, such as caves, shelters and rocks, usually have intrinsic sensorial power which helps to create a symbolic atmosphere shared across time and space. When analysing transversely these contexts in the Ancient Mediterranean, from Bronze Age to Classical times, coincidences start emerging. The material record connected to the cultural and social values is increasingly shedding light on the reconstruction of these practices, their performers and their audience.

Taking the rocky space as a common element in ritual places, the main aim of this session is to examine the rituality which was experienced in caves, shelters and rocks in the Ancient Mediterranean from a broad perspective and over a long period of time. We propose to discuss this topic by referring to different aspects: research of repeated practices, the meaning of places anchoring the memory in the landscape, the ritual journeys or the sensitive and emotional experiences perceived during the whole performance, among others.

Different approaches and methodology which can enrich research on ritual archaeology are welcome. With this in mind, we seek contributors that present their study cases or theoretical contributions from different locations situated in the Mediterranean area from Bronze Age to Classical times. Different periods, different people and different cultures and beliefs which share one common link: rocky natural as symbolic places.

01 RITUAL CAVES OF THE ANCIENT MAYA

Author(s): Moyes, Holley (University of California, Merced)

Presentation Format: Oral

Throughout ancient Mesoamerica the natural landscape played a prominent part in religious thought and action. Mountains, caves, waterholes, ravines, boulders, and trees were fundamental in shaping ancient cosmologies, grounding supernatural realms in real-world environments, and linking mythic realms to natural features. Research based on ethnography, ethnohistory, and ancient iconography demonstrates that both natural and man-made caves, particularly those that contain life-giving water, were thought of as sacred cosmological features. They were considered to be entrances to the underworld and the home of deities associated with fertility, rain, and the sacred earth. This helps explain why natural caves were and continue to be used exclusively as ritual spaces among indigenous people today.

Cave sites provide archaeologists with an unambiguous context to study ritual and religion in the deep past. Archaeological work in Belize sheds light on how these sites were employed in ritual practice by ancient Maya people. My work over the last 20 years demonstrates that caves were used as a path to power by ancient Maya leaders to link themselves to cosmological forces, ideologically (or quite literally) by coopting the natural landscape via cave ritual or by creating artificial caves in their architectural constructions. In this paper I will demonstrate that cave rites proliferated in the turbulent Late Classic period as a megadrought descended on the lowlands destabilizing the local political systems. I argue that this ritual response not only served as a ritual technology to induce rain, but also as a stabilizing force to promote social solidarity in a time of duress.

02 SIKKANUM, BAITYLOI AND MAŞŞEBAH. ANICONIC STANDING STONES OF THE LEVANT

Author(s): Scheyhing, Nicola (none)

Presentation Format: Oral

From the 3rd millennium B.C. on, written and archaeological sources of the Levant, Syria and eastern Anatolia refer to a complex of cultic installations, mainly made of upright standing stones. These objects are commonly known from antique and biblical texts as the Greek *baityloi* or the Hebrew *maşşebah*, naming stone installations, which were venerated as representations of deities or ancestors, as well as a matter of communication with them.

First indications for the adoration of aniconic stelae and similar objects dating back at least to Early Bronze Age, where the oldest known evidences could be proven by contemporaneous cuneiform tablets. Appearing also in Sumerian texts as *sikkanum*, these objects range from unworked local material to roughly shaped stelea or columns, appearing as single installations as well as in alignments and groups. Not only known from ritual buildings, there is also a number of erected stone structures from hilltops or city gates. Clearly connoted with a ritual meaning as an aniconic representation of divine character, these exemplars could have been meant to create a sacred space or adjoin a sacred meaning to a place or structure. In my talk I give an overview about the written sources relating to the complex of the veneration of artificial erected stone objects as well as a compulsion of the archaeological evidences. Furthermore, I illustrate their significance as a matter of demarcation and determination of sacred spaces.

03 THE RIPARO SAN TOMMASO AND THE RITUAL LANDSCAPES OF CENTRAL SICILY BETWEEN THE 2ND AND THE 1ST MILLENNIUM BC

Author(s): Giannitrapani, Enrico (Arkeos - Servizi integrati per i Beni Culturali s.c.)

Presentation Format: Oral

The Riparo San Tommaso is a vast rock shelter located immediately south-east of Enna (central Sicily), along a deep gorge cut by the Torricoda river in the rocky substratum formed by marls and calcarenites dating from the lower to the middle Pliocene. In the shelter several trenches opened between 2000 and 2010 allowed to investigate an archaeological deposit dating between the Late Copper Age and the Iron Age. Micromorphological analyses suggest that, in the earliest phases, the shelter was used seasonally mainly by shepherds for the stabling of animals (*ovis/capra* and *sus d.*), although for these prehistoric periods there are evidence that indicate its use also for ritual and funerary purposes, such as the deposition of deer antlers and miniaturized vessels dating to the Early Bronze Age. From the Late Bronze Age and throughout the Iron Age, the seasonal frequentation of the shelter involved its use exclusively as a riverine sanctuary. Such a sacred meaning is evidenced by the monumentalization of the structures built inside it and by the presence of various votive offerings, with the deposition of young animals and of indigenous and imported ceramics. Its hidden location within the Torricoda gorge, distant from the main communication routes, makes this a site accessible only intentionally by those who had specific knowledge, reasons or wishes to reach it. While the various contemporaneous sanctuaries known in central and western Sicily were actively used by local elites in order to establish and to consolidate hierarchical status and power within their communities, the San Tommaso shrine, active up to the end of 6th century BC, was probably used directly by Greek colonists as meeting point for interactions and exchange with indigenous communities, a social and religious liminal place acting as a redistribution locus between the economy of inner Sicily and the coast.

04 RITUAL AND SOCIAL IDENTITY AT THE BINIEDRÍS CAVE (ALAIOR, BALEARIC ISLANDS, SPAIN)

Author(s): Moreno-Onorato, Auxilio - Alarcón-García, Eva (Department of Prehistory and Archaeology, University of Granada) - Diaz-Zorita Bonilla, Marta (Institut für Ur-und Frühgeschichte und Archäologie des Mittelalters, Eberhardt Karls Universität, Schloß Hohentübingen) - Arboledas-Martínez, Luis (Department of Prehistory and Archaeology, University of Granada)

Presentation Format: Oral

The Biniedrís cave is presented as a ritual space where bodies of two different communities or two different groups have been recovered this cave.

Is made up of 18 m² comprising a great commingled burial ground along with a variety of grave goods. Among the most spectacular material culture, the V-perforated buttons have been documented. The specific climatic conditions of the cave allowed the preservation of some organic material such as plants and wood remains from different species. In addition, the technology and the production process including some elements such as stretcher and cooking accessories have been also documented. The ritual as an individual concept is clearly observed in the inner limits: there is such a space where some pots were deliberately fragmented aiming for a mortuary ritual. In a different space, the clustering of human skulls, clearly organized and surrounded by wooden structures is again reinforcing the burial ritual. The investigation of these group practices associated to another personal practice such as the small wooden boxes to contain the artificial red coloured hair are among our main objectives.

The main objective of this research project is to capture, through the acts, the human remains and the material culture the social ideology of the communities among the 2nd and the 1st millennium BC in the Balearic Islands (occidental Mediterranean).

05 CAVE ART OF TRANSBAIKALIA (SIBERIA, BRONZE AGE)

Author(s): Ponomareva, Irina (Griffith University)

Presentation Format: Oral

This paper presents a preliminary study of the cave art of Transbaikalia, the region in Siberia to the East from lake Baikal. This art as a particular type of rock art sites has not been touched by research, although it definitely deserves scientific attention. There are about a dozen of known cave rock art sites depending on what to consider as a cave or rather as a shelter. These sites are considered to be related to the Bronze Age. They share the set of motifs and their style with the rock art of open sites which is quite uniform throughout the most of Transbaikalia. However, the rock art site, both open ones and caves, occupy different landscape settings. For instance, sometimes the cave rock art sites are found on easy-reachable lower mountain levels or single rock outcrops, while in other cases they can be assessed by a few-hour walk through a harsh terrain. It is generally assumed that prehistoric societies could have created different art for different purposes or different audience. The question is whether Transbaikalia cave art sites served a specific purpose or the distinction of rock art sites was based on different criteria. This question will be answered through the comparison of cave art sites and adjacent open sites in their art content, style and landscape setting. The analysis is based on the author's field material.

06 CAVES IN BRONZE AGE CENTRAL ITALY: DIVERGING OR CONVERGING RITUALS?

Author(s): Silvestri, Letizia (Durham University, Department of Archaeology) - Achino, Katia Francesca (Quantitative Archaeology Lab, Department of Prehistory, Autonomous University of Barcelona; Institute of Archaeology ZRC SAZU) - Angle, Micaela (Soprintendenza Archeologia del Lazio e dell'Etruria meridionale) - Mancini, Daniela (Ministero dell'Istruzione, dell'Università e della Ricerca) - Gatta, Maurizio (University of York, Department of Archaeology) - Rolfo, Mario Federico (Dipartimento di Storia, Patrimonio culturale, Formazione e Società, Università di Roma "Tor Vergata") - Skeates, Robin (Durham University, Department of Archaeology)

Presentation Format: Oral

Caves are the most common ritual sites in the Italian late Prehistory. Over 100 caves with a wide range of purposes are known for the Bronze Age in central Italy, many of which have also a funerary connotation and were often used ritually since the Neolithic. Archaeological caves of this period outnumber greatly the known settlements, which makes these rocky places even more crucial in reconstructing the social dynamics of this region. A critical review of the case-studies published over the last century, complemented and enriched by new multi-disciplinary research undertaken over the last decade in several caves of central Italy, has allowed to identify some recurring trends, while also highlighting the great variety of rituals undertaken in these sites. Caves have profound differences in location, orientation, shape, illumination, speleothems and landscape features. Is such variability responsible for the different ritual manifestations in these sites, or are these diversified practices related to a diversity of systems of belief among the various communities? To what extent can these caves and their archaeological deposits help describe and understand a human group's social identity? Through the integration of theoretical and scientific approaches, this paper will analyse the ritual practices identified in the caves of Bronze Age central Italy, trying to clarify their significance in the framework of the local Bronze Age human lifeways.

07 SANCTUARIES OF « ROCK-SPRING »? RITUAL PRACTICES AROUND FAJOUSE'S SITE AND IN THE GREEK WORLD

Author(s): Dunyach, Ingrid (Université de Perpignan; Association archéologique du GPVA)

Presentation Format: Oral

The archaeological excavations led between 2013 and 2015 on the Fajouse's site (Argelès-sur-Mer, Pyrénées-Orientales, France) allowed to highlight ritual practices around a water spring flowing at the bottom of a rock. This ritual evidence has been documented from the 6th century BC to the 6th century AD: a ritual endurance that is related to the ritual activity around this spring. Many offerings have been found around the spring, such as miniature vases, krateriskoi, cups, perfume vases... All these artefacts are evidence of typical ritual practices related to the Greek world and/or to strongly Hellenised populations. Located on the top of the Alberes's mountains, the Fajouse's sanctuary seems to mark the boundaries of the Iberia North-East Greek cities territory of Emporion and Rhode.

A research on similar archaeological remains (spatial distribution of artefacts and ceramic tableware, ritual practices, topography and landscape, archaeological context around a site, etc.) allowed to get the potential and importance of these rupestrian sanctuaries included in a type we called "rock-spring sanctuaries". Not only the concordances found in ritual practices, but also in the landscape of these sacred spaces too, authorize to propose several requirements of analysis to identify practices linked to the Hellenic tradition into the Fajouse's site and widely in the North-West Mediterranean Coast.

08 A CULT CAVE FOR DIONYSUS AND THE NYMPHS

Author(s): Denk, Olivia (University of Basel)

Presentation Format: Oral

In the seaside sanctuary of Kallithea on the Chalcidice peninsula in Northern Greece a ritual cave for Dionysus and the Nymphs was discovered. The sacred area formed an extra-urban cult place, which belonged to the nearby ancient city of Aphytis. While the natural cave with its spring water had long been in use since the Bronze Age, ceramics of the 8th century B.C. indicate a cult for Dionysus. The importance of the site stems from the fact that it represents one of the few caves in Greece that are certainly identified with a specific deity. The site is part of the Swiss research project "Cults and Sanctuaries on the Chalcidice," based at the University of Basel which explores the sacred landscape in the microcosm of the Chalcidian peninsula. The aim of this paper is to investigate the character of the cult cave with its ritual dynamics by using an interdisciplinary approach. Beside the architectural features, the literary, epigraphical and numismatic sources will be discussed. The archaeological materials (ceramics and a marble head) provide the main items employed to detect the worshipped deities of the site. An interesting aspect is the apparent changing function of the cave, when later the temple of Zeus Ammon is established next to it. Within this unique context of a ritual cave in a syncretic sanctuary area, the phenomena of tradition and innovation need be analyzed. As a result the characteristics of the cave will be illustrated and its status will be set in a broader view in order to interpret transcultural events in the Northern Aegean.

09 THE GEOARCHAEOLOGICAL EVIDENCE OF A SANCTUARY DESACRALIZATION DURING ROMAN TIMES. HIGH-RESOLUTION MICROSTRATIGRAPHICAL ANALYSIS OF COVA DELS JURATS SEDIMENTS (CALESCOVES, MENORCA)

Author(s): Gutiérrez-Rodríguez, Mario - Orfila Pons, Margarita (Universidad de Granada) - Goldberg, Paul (Boston University; Eberhard Karls Universität Tübingen; University of Wollongong)

Presentation Format: Oral

The archaeological excavation carried out in Cova dels Jurats of Calescoves (Alaior, Menorca) identified a cave-sanctuary dating from Post-Talayotic to the Roman era. The cult developed during the Post-Talayotic period is, to a large extent, little known. However, a series of inscriptions located at the entrance of the cave reveals the divinity that was worshiped as well as some specific rites developed during the Roman chronology: the cult to the Dea Roma, the festivity of the Parilia and the Ludi Ceriales. The excavation allowed the identification of a very complex finely stratified sequence as well as the recovering of different elements involved in the cult: mainly ceramic vessels and bone remains of the animals sacrificed. It is highlighted the wide range of ceramic imports from the island of Ibiza, black glazed ware from Italy or Hellenistic bowls from the Ionian area. Recently a multiproxy study of geoarchaeological nature has been carried out in order to identify the site formation processes involved in the genesis of the archaeological record. Soil micromorphology and geochemistry have shown that the chronostratigraphic sequence is closely related to a seasonal occupation of the cave for animal penning. Maintenance activities of this space, such burning, have been evidenced. We can conclude that the studied sequence corresponds to a fumier. These activities were developed once the ritual space was desacralized. Our study explores the following question: To what extent did the ritual activities developed in cave-sanctuaries leave sedimentary evidence?

10 MODES OF RELIGIOSITY IN THE IBERIAN IRON AGE CAVES: RELIGIOUS BEHAVIOUR AND SENSITIVE EXPERIENCE

Author(s): Machause López, Sonia (Universitat de València) - Amorós López, Iván (Servei d'Investigació Prehistòrica) - Rueda Galán, Carmen (Universidad de Jaén) - Grau Mira, Ignasi (Universitat d'Alacant)

Presentation Format: Oral

The Iberian Iron Age caves are defined as a specific model of sacred space. First, from a territorial perspective, they are identified as liminal spaces where the collective participation, integration and the sense of belonging is reinforced. And secondly, as multisensory contexts, where different ritual practices, highly symbolised, are performed. These spheres, cut off from the well-known and daily scenarios boost the sensory hypersensitivity, strengthened by the connection between the senses and the natural scenario.

This paper is guided by the theory of religiosity modes, developed by H. Whitehouse, with the purpose of a better understanding of the ritual practices that were carried out in Iberian caves. This theoretical framework proposes two main models of religiosity, doctrinal and imagistic, that are contrasted and / or complement each other, as a way of measuring religious and ritual actions. Regarding these two modes of religiosity, the caves would be an example, mainly, of the imagistic mode, in which the emotions play a major role. In this sense, we focus on how they influence the religious structure and the organization of the liturgy and practices. Following a methodological approach that allows the analysis of sensory and emotional empathy, we empirically analyze the archaeological record with examples from Iberian ritual caves.

11 RITUAL CAVES IN NETWORKS OF SOCIAL PRACTICES. LANDSCAPE, MEMORY AND PERFORMANCE IN THE SOUTHEASTERN IBERIAN PENINSULA

Author(s): González Reyero, Susana (Spanish National Research Council)

Presentation Format: Oral

The study of ancient ritual sites is frequently based on very few known elements, repeated in the bibliography. This represents a serious obstacle to a systematic and wide comparison between ritual sites.

This is the case of Umbría de Salchite (Moratalla, Murcia), a ritual cave mainly known for its iconography and its location, hypothetically supraterritorial. Our study tries to integrate the sanctuary into a landscape endowed with social references (González et alii, 2014). We underline that this case does not fit the model of habitat-necropolis-sanctuary set, which is well known from other cases (La Encarnación, La Luz, El Cigarralejo) of the southeastern Iberian Peninsula.

I will discuss several topics that provide elements for comparison between different ritual caves.

First, I will emphasize the peculiarities of this sanctuary placement in terms of lighting, humidity, coloration and visibility, which would make the Umbría de Salchite an imposing landmark, a possible refuge, a time marker, a place with a distorted sensorial perception where to make a pilgrimage to ... Consequently, I will highlight how this type of caves must have been central in the life of ancient communities, fundamental nodes of their cognitive geography.

Secondly, I will present Umbría de Salchite as a place full of memory connotations, a place endowed with meaning and inscribed by Bronze Age communities. It was also the visual horizon of nearby Iron Age communities from Molinicos, where some firedogs have an iconography with clear similarities to that of Umbría de Salchite.

In third place, I will advance in the social practices developed there, with the transformation of objects by means of lead clamps, the presence of bells that suggest music and an iconography that I will argue is strongly rooted in the territory.

12 ASTRONOMY AND RITUAL IN IBERIAN IRON AGE CAVE-SANCTUARIES

Author(s): Esteban, César (IAC)

Presentation Format: Oral

In this paper, I present results of archaeoastronomical studies carried out in several Iberian Iron Age cave-sanctuaries of the south-east Iberian Peninsula: La Lobera, La Nariz, Cueva Santa del Cabriel, Cueva Negra and others. Most of these caves are facing west-erly. The entrances or windows of some of the caves show accurate orientation towards the local sunset at singular moments of the solar calendar, as equinox or solstices. Moreover, in some of them, at those particular moments of the year, striking illumination patterns are produced, reinforcing the symbolism of the alignment. These sunlight phenomena can even be considered hierophanies that suggest the willing of the Iberians to produce a dramatization of the visual experience. I discuss these findings in the light of archaeoastronomical results found in a large number of Iberian temples and other open-air sanctuaries, where the astronomical relations are mostly with the sunrise and with topographic elements of the horizon, especially at the equinox or a date close to it. The different systematics in the alignments and astronomical targets in caves and other Iberian sacred places should be related to differences in the type of cult and rituals carried out in both kinds of sites. I also briefly discuss the results in the framework of the archaeological context of the caves.

13 RITUALS IN THE DARK: EXPLORING CAVE RITUALITY IN CELTIC-ROMAN SPAIN

Author(s): Alfayé, Silvia (Universidad de Zaragoza)

Presentation Format: Oral

As osmotic membranes where the supernatural could be encountered, but also as powerful thresholds of separation, transition and transformation, caves were used as multi-purposed ritual venues by the Protohistoric and Roman populations of Hispania Celtica, from the 4th BC to the 3rd century AD. Archaeological, epigraphical and iconographical record of a variety of ritual activities are attested in these rocky topographies: manipulation of Prehistoric human remains; deposition of pottery, coins, weapons, personal ornaments, and altars; writing of texts; making of graffiti and muddy figurines; underground journeys; religious recycling of Prehistoric rock-art; healing practices; collective ceremonies; modification of speleothems; rites of passage; etc. But despite its potential, they remain to be understudied. On the basis of fieldwork and anthropological experience as "participant observer", this paper discusses the methodological problems and explores some themes of the cave rituality attested in the area of Central Spain from the Iron Age to the Roman period, including its symbolic meanings, deities, ritual agents and audiences, gender bias, and multiplicity of ritual practices. Moreover, this paper focuses on the pervasive centrality of darkness in the ceremonies held deep inside these Spanish caves, and its role to shape the participants' actions, emotions & experiences, and to form the "landscape context" of rituals.

14 IS THIS RITUAL? ROCK ART AND EPIGRAPHY IN THE CAVE OF "LA ZAIDA", USED (ZARAGOZA, SPAIN)

Author(s): Alfayé, Silvia - Bea, Manuel - Jordán, Carlos - Marco, Francisco - Utrilla, Pilar (Universidad de Zaragoza)

Presentation Format: Oral

A group of engravings have been recently discovered in the corridor of the natural cave of "La Zaida", in Used (Zaragoza, Spain). Located at a strategical place, close to an endorheic lake where birds stand during their migratory shifts, the cave is unfit for human habitation. Therefore, the Bronze and Iron Age potteries found inside "La Zaida" decades ago had been related to ancient ritual activities. The unpublished rock-motifs are carved on the right wall of a narrow corridor, being illuminated by natural light from the entrance. The engravings are included in a rectangular frame, which is divided into six different parallel fields separated by horizontal lines. Some of the carvings can be identified as Latin letters belonging to an inscription, and other motifs remind of Palaeohispanic writing-signs, although its reading and translation are problematic. Nevertheless, they shows parallels to other Palaeohispanic and Roman religious inscriptions carved on cliffs, rockshelters and caves of the Iberian Peninsula. On the basis of new methods of documentation (Structured Light 3D Scanner and Photogrammetry) and fieldwork, the interdisciplinary study of the rock art, epigraphy and archaeological materials found in the cave of "La Zaida", but also of its topographical distribution and cultural parallels, offers the possibility of bringing new light to the understanding of the ritual and symbolic practices performed in sacred rock-scapes of the Iberian Peninsula over time.

a. RITUALS THROUGH THE LANDSCAPE: CAVES IN THE IBERIAN TERRITORY OF KELIN (5TH-3RD CENTURIES BC)

Author(s): Machause López, Sonia - Quixal Santos, David (Universitat de València)

Presentation Format: Poster

The Requena-Utiel plateau, in the interior of the province of Valencia (Spain), was the territory of the Iberian oppidum of Kelin. This territory constitutes an ideal framework for the study of caves-sanctuary, for its quantity, its characteristics and the richness of its materials. During the Iberian Iron Age (from 6th century to 1st century BC), some caves, generally located on the limits of the territory, were visited in pilgrimage and used for diverse rituals of passage, just performed by a segment of the privileged population. In this area, there were at least five caves with Iberian materials identified as ritual spaces. They all share a clear pattern in relation with the following features: proximity to water sources, link with relevant roads, location in border areas, absence of surrounding settlements, offerings found inside of them, symbolic iconography and ritual memory maintained across time.

Like in other examples of the Iberian Iron Age, in Kelin, these ritual caves were spaces closely linked to the process of territorialisation which occurred in the area between the 5th and 3rd centuries BC. Their location played a symbolic role, not only in the sacred landscape, but also in the political and social sphere. In fact, it is highly significant how the appearance of the cult in cave (5th century BC) shares its time within the urban growth of the central place, Kelin, as well as the beginning of its hierarchical organisation of the territory. Finally, the decline of this cult (from the 2nd century BC) was contemporary with the development of the roman control over the Iberian settlement pattern.

b. THE SALA DEL LLAC AND SALA DE LA MAMELLA. RITUAL SPACES IN THE FONT MAJOR CAVE (ESPLUGA DE FRANCOLÍ, TARRAGONA)

Author(s): Serret, Ivan (Universitat Rovira i Virgili) - Pérez, María (Grup de Recerca Seminari de Protohistòria i Arqueologia - GRESEPIA) - Diloli Fons, Jordi - Ferré Anguix, Ramon - Bea Castaño, David (Universitat Rovira i Virgili) - Sardà Seuma, Samuel (Universitat Pompeu Fabra)

Presentation Format: Poster

Font Major Cave is located in the village of Espluga de Francolí (Conca de Barberà, Tarragona). It is the birthplace of Francolí River and the result of the emergence of Espluga karstic system. Centro Excursionista Pirenaico de Barcelona discovered it in 1956 and during

the 60s of the 20th century, Dr. Salvador Vilaseca and his team carried out archaeological interventions with results that highlighted the importance of the site in relation to the long occupational sequence and the different uses that they had given to it. The work carried out by our team, the Grup de Recerca Seminari de Protohistòria i Arqueologia (GRESEPIA) of Universitat Rovira i Virgili (URV), was based on the study of the materials exhumed by Dr. Vilaseca in Sala del Llac and the Sala de la Mamella, dated between the Bronze Age and the Iron Age period. We analyzed its ritual meaning within the context of Cova de la Font Major and the first room stands out for the large quantity of materials found and for being in contact with the flow of the subterranean river that passes there and the second stands out for being the space where they discovered a store of bronze materials.

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ANTHROPOMORPHISM IN MATERIAL CULTURE AND LANDSCAPE: APPROACHING A FUNDAMENTAL OF HUMAN COGNITION

Theme: Theories and methods in archaeological sciences

Organisers: Gheorghiu, Dragos (National University of Arts - Bucharest) - Paladino, Vincent (American Anthropological Association)

Format: Regular session

Anthropomorphism is one fundamental example of the analogous thinking of humankind: that of projecting a human corporal image over the surrounding world.

Anthropomorphism contributes to the human sense of control over the environment and an increased sense of knowledge and insight about the world they inhabit. It is a characteristic of thought that bestows a feeling of protection through understanding, and thus represents the human capacity for reasoned thought as a tool for defense and survival. Anthropomorphism is an aspect of human cognition that displays a unique capability and inherent bias toward creating a conceptual framework first, then modeling material culture and society. For a mental control of cosmic phenomena, supernatural entities, geomorphs, and up to spatial organizations or objects, humanity used anthropomorphic images or symbols. Anthropomorphism is also a type of self-reflection, whereby humans can contemplate the verities of their lives through projection onto other species.

Although less studied, anthropomorphism is a significant cognitive subject for archaeology, being present in material culture and landscape, both as icons and diagrams, from early prehistory up to the modern world.

This is the reason why the present session proposes archaeological approaches to the anthropomorphic images that are determined by nature or culture.

ABSTRACTS

01 ANTHROPOMORPHISM: AN EXPRESSION OF RATIONAL THOUGHT

Author(s): Paladino, Vincent (American Anthropological Association)

Presentation Format: Oral

Human cognition is embodied in material culture as utility for survival. For humans, survival is achieved through a combination of reasoned and emotional responses, executed within social structures through the cognitive ability to project into the future and reflect upon the past. Intention and a sense of purpose is established this way, learning between generations is enabled and cognition is distributed through culture. Human beings are active agents of change within the world, observing, evaluating and building that which is needed to transduce energies and direct their vectors. During this process, people have observed human and animal qualities, and made conclusions concerning similarities and dissimilarities in their typological analysis. Anthropomorphic symbols represent accumulated knowledge about the world and its inhabitants, human and non-human. Anthropomorphism expresses the particular human ability to solve problems through social interaction that breeds trust and cooperation. As symbols, they represent the power humans wield through rationality, logic and reason. Anthropomorphism represents our effective interaction with our environment mediated by reasoned exchange. The power and influence that reasoned thought holds within human communities is extended via anthropomorphized non-human entities. Bringing non-human entities into the human community by ascribing to them human traits provides a sense that they can be influenced. The power of persuasion is believed to increase over "others", both animate and inanimate. The representation of human/animal physical integration symbolizes observations and conclusions concerning animal qualities and their supposed correlates in human traits and actions, as well as benefits gained through their combination.

02 ECHOES THROUGH TIME OF MYTH AND METAPHOR

Author(s): Dods, Roberta Robin (The University of British Columbia)

Presentation Format: Oral

The mundane and transcendental manifest in transformations over time/space in various and diverse cultural advents in our struggle to explain our "beingness". Our philosophies did not come to us only when we became literate. Archeologists know this as we have recovered (uncovered) material culture that was the voice of the teacher of all in the oral tradition past. The literate (essentially the

word made manifest in a material form) and the hardware indicate thought and the capacity to make thought evident and transgenerational beyond the voice of the elders with their teaching through presence. And so, from the depths of time, oral traditions gifted us a compilation of our evolving consciousness and it is through this we came to deliberate on our existence and the worlds we confront – both physical and metaphysical. The oral world was and remains stable and yet easily mutated – a seeming contradiction, yet not unexpected in a dynamic representation of ourselves through myth and metaphor. Myth and metaphor, yet and again, has become a specific study with well-structured theory and methodology and extended academic discussions. Thus, it provides insight into the cultures of deep time as well as a commentary on our transgenerational concerns.

03 “THE LOGIC OF THEIR WAYS:” TYPOLOGIZING ANTHROPOMORPHISM IN COGNITIVE ARCHAEOLOGY WITH EXAMPLES FROM THE NORTHERN AMERICAN SOUTHWEST

Author(s): van Roggen, Judith (Okanagan College, Kelowna, British Columbia; The University of British Columbia Okanagan)

Presentation Format: Oral

Ancestral Puebloans and their descendants of the northern American Southwest share a distinctive existential logic that includes a ubiquitous anthropomorphism. Ethnographic research has provided a rich repository of data that ties such imagery to sociopolitical roles of longue durée. Although still the object of criticism in archaeology, the use of data from the historic period does not need to be seen as too tainted by associations with colonialism, or as exercises in overly optimistic imaginings. Such criticisms serve only to assuage the unease of those who view “science-based” fact as one requiring legalistic “proofs.” A cognitive archaeology solves such dilemmas through the use of typologies. Archaeologists, of course, are in the unique position of being typologists par excellence. I propose such a method to meet the requirements of “proofs” through analysis of the material culture of the late 13th Century Sand Canyon Pueblo of southwestern Colorado. Sand Canyon harkens back to the Pueblo past of Chaco Canyon, New Mexico, an area equal in complexity to the great agricultural civilizations of Mesoamerica and the Middle East. As it is human nature to typologize experience through anthropomorphic associations, typology also serves as a process that finds connections between symbolic entanglements based on such foundations. The ancient record becomes evidence of what Clifford Geertz states as both a “display of internal logic,” and, “the logic of their ways.” Sand Canyon’s material culture offers up a remarkably congruent example of a bridge between pasts, an evolution of complexity, and durability of the same logic into the 21st century. Its insights suggest a useful approach for typologizing “thought” in archaeology generally.

04 ANTHROPOMORPHIC IMAGES AS INTERPLAY BETWEEN NATURE AND CULTURE

Author(s): Chroustovsky, Lubos (Faculty of Philosophy and Arts, University of West Bohemia in Pilsen)

Presentation Format: Oral

Human imagination is a powerful tool that may be easily triggered by unusual features and phenomena of natural landscape. Unfortunately, many of such triggers accessible to past communities (like various weather conditions, prevailing winds, thunder, lightning, attractive aspects of fauna or vegetation) disappeared entirely without leaving any trace for archaeological prospection. Therefore, I focus my interest on natural rock features that are immovable and (relatively) durable. Their immovability has made them to be present within a specific place for a very long time. Durability of their matrix has helped to preserve their specific shapes. I believe the first step to consider their potential to provoke anthropomorphic images resides in formalized survey of visual imagination engaging hundreds of participants. I shall present the results of two case studies dealing with attractive rock features directly associated with archaeological record (a hoard deposited at a menhir-shaped rock and a conspicuous rock within a hillfort) that demonstrate a high impact of cultural stories on human anthropomorphic imagination. Although it’s impossible to extrapolate contemporary images into the minds of the past people it is valuable to observe structural aspects of such images (their graphics and verbal description) and to consider processes that have brought them to the light of the archaeological research.

05 “YOU ARE NEVER ALONE IN NATURE!” ANTHROPOMORPHISM, ANIMISM AND RATIONALITY ANCIENT AND LIVING MEMES IN NORWEGIAN CULTURE

Author(s): Lindstrom, Torill Christine (Dept of Psychosocial Science, University of Bergen; SapienCE, Centre for early Sapiens Behaviour, CoE)

Presentation Format: Oral

The philosopher and culture historian, Nina Witoszek claims that Norwegian culture, from the most ancient sources (“Edda”) until modern eco-philosophical movements and trends, is permeated with deep and persona (“animistic”) relationships with nature; yet at the same time is a culture that has strict rationality as a basic value. – These two memes, “animism” and “rationalism” may appear contradictory. Based on human perception and cognition, I will argue that they are not. – Face recognition is a fundamental human capacity, (and prosopagnosia is a serious condition). Face-recognition underlies the common phenomenon of pareidolia (that one “sees faces” in inanimate objects). Pareidolia, in addition to projection, is the basis for anthropomorphism and animist attitudes to inanimate objects in nature: attributing them with human traits. When it comes to animals, the situation is different. As animals and humans have many capacities and characteristics in common, “anthropomorphism” and “animism” are inaccurate term. Animals do resemble humans and do have animae. “Anthropomorphism” is here more of an approximate term. – So, there are rational reasons based in human cognition, perception and experience for what we call “anthropomorphism” and “animism”. – I will present examples from Norwegian nature and landscapes illustrating pareidolia; and I will present examples from Norwegian culture illustrating the

strong animist-rationalist connection in art from the Migration period, Viking age, Medieval age, and the Twentieth century.

06 LANDSCAPE ANTHROPOMORPHISM: PLACES WITH FACES

Author(s): Devereux, Paul (Time & Mind Journal)

Presentation Format: Oral

"The land is a living book in which the myths are inscribed ... A legend is captured in the very outlines of the landscape." (Lucien Levy-Bruhl)

A simulacrum is the chance likeness to a face, animal, human figure or other form seen in the configurations of clouds, the coals of a fire, the bark of a tree, or other surface. For example, Leonardo da Vinci advised his apprentices to study the "exquisite landscapes" formed by the mould stains on his studio walls. To see simulacra is a psychological quirk of perception known as 'pareidolia'. Whereas today we consider it as a mere curiosity, in many ancient and traditional cultures it was a significant form of cognition.

Simulacra can also be large scale, spied in topographical forms, and their appropriation allowed an ancient society to see its mythology emblazoned on its territory; the very landscape became mythically alive with the forms of culture heroes, deities, totemic beings or some symbolically significant icon. It became a cultural mindscape. The Australian Aboriginal perception of the topography as being formed by Dreamtime beings is now well-known -- ancestral beings were "turned into place". The scale of features recognised by this "dreamtime" mode of perception could range from a small boulder to a rock outcrop or to a whole hillside or mountain range.

This largely visual presentation will show examples of anthropomorphic, zoomorphic and iconic simulacra acknowledged by ancient peoples from various parts of the world, and will discuss how they can aid our understanding of ancient perception and thought, as well as providing archaeological insight.

07 WITNESS. STANDING STONES' ROLE IN MAINTAINING THE COSMIC ORDER

Author(s): Higginbottom, Gail (Australian National University)

Presentation Format: Oral

This paper will include a short review on some of the interpretations on standing stones known to date. We know that as a group standing stones, regardless of form, have continually had the same two associations and/or relationships across Scotland and elsewhere in the British Isles: the dead (often cremated) and astronomical phenomena. In this paper it is argued in more detail than previously, that standing stones were considered as living witnesses to the cosmic order, gaining their local power and supernatural associations from the dead (inserted into the holes containing the megaliths themselves, or at the foot of or near the standing stone). Speculatively, it is suggested that through this juxtaposition, the stones were given the power to see what the living could, and perhaps it was believed that through the stones the entombed or buried dead could see this as well.

The stones, then, clearly have individual agency, and are participating in events themselves. They have become individual members of the community and, in this final sense, their anthropomorphic identities assured. In this way, this paper supports Taçon's notion that standing stones were 'such a widely used monumental form because of (their) anthropomorphic connotations' (1994 in Cooney 2000: 131).

08 THE ROCK-CUT SITE ON MYRINA KASTRO: NATURAL-CUM-ARTIFICIAL SCENERY AND INCARNATE ARTEFACTS

Author(s): Marangou, Christina (Independent researcher)

Presentation Format: Oral

In the North-East Aegean Sea, on the Western coast of the island of Lemnos, the Kastro hill is situated on a peninsula delimiting the harbour of its capital, Myrina, from the North. On-going research on the site suggests a continuous occupation at least since the Bronze Age till the Hellenistic period, well before the construction of its Medieval and post-Medieval castle.

The Kastro volcanic rocks have been carved in various sectors of the peninsula, on different altitudes, with the resulting rock-hewn structures and delimited spaces, as well as rock-art, being fully integrated in the environment. Indeed, landscape features and topography seem to have even influenced human actions, while, in several instances, man-made constructions have incorporated or were connected to rocks, whose shape, orientation or location may have been determinant. The study, still in progress, has uncovered complex places, often involving a maritime bias, that include functional and not obviously functional structures and mobile finds.

The paper endeavours to present an outline of the rock-cut site and suggest "reading" approaches of anthropomorphism as conceived, implied, symbolized and materialized within a mixed natural and artificial scenery. The coastal and rocky landscape was controlled and organized and had been transformed into human space, both literal and symbolic.

09 VENUS OF GAVÀ. AN APPROACH ITS SYMBOLOGY THROUGH ITS TECHNOLOGICAL RECONSTRUCTION

Author(s): Calvo Peña, Silvia - Gómez, Anna (Universitat Autònoma de Barcelona) - Bosch, Josep (Museu de Gavà) - Molist, Miquel (Universitat Autònoma de Barcelona)

Presentation Format: Oral

The Mines Prehistòriques de Gavà was a mining production, where beads have been made of Variscite. This work was made by artisans from a homogeneous cultural group associated with the consolidation of farming practices in Catalonia during Middle Neolithic period. All archaeological fieldworks highlight the uniqueness of the site since its discovery in 1975. On the one hand, by the type of mineral extracted for ornamental use, the Variscite; and on the other hand, the complexity of mining structures, wells, and chambers are forming a dense underground network. This corporal ornamentation made with green beads is well recovered in the necropolis like good graves and has been found along European Atlantic coast, southeast of the Iberian Peninsula, in Catalonia, in France and in Sardinia, among others.

An almost complete pottery vessel was recovered from different refilled levels in mine 16. It is a singular anthropomorphic vessel with a pregnant woman called Venus of Gavà was found. This vase was made by mass of clay, combining plastic application and incisions and it has been dated between the years 4000 and 3800 calBC. The aim of this presentation is to show how the feminine symbology this specific production relates to the cult of mother goddess, a relationship with the so-called <<pregnant goddesses of the vegetation>> of the Balkan area, relate it to the cult of fertility both in the agricultural sense and in relation to the fertility of the mineral. This symbolism represented by the identification of the breasts, the bulging abdomen and the possible representation of the vulva in the form of an inverted spike, was a product of the local knowledge and how external influences, such as Chasséen tradition, could be involved in their production. This approach will take place through a reconstruction of its chaîne opératoire.

10 DOMESTICATION OF HUMAN BODY: THE EMBODIMENT OF NEOLITHIC HOUSEHOLD IN THE BALKANS

Author(s): Naumov, Goce (Museum of Macedonia; Center for Prehistoric Research)

Presentation Format: Oral

Domestication in the Neolithic is commonly related to agriculture and taming of wild animals. But this process was much broader and considered people as well. The change of economic practices also regarded novel social norms and more complex understanding of manmade environment. In such significantly changed society the man was the major driving force and the human body become primary symbolic reference. Almost anything that was produced in the Neolithic, from large constructions such as dwellings to small items such as stamps, was also embodied and semantically elaborated through anthropomorphism. The anthropomorphism was incorporated in order to demonstrate that almost anything that was made and used by man was symbolically functioning as the human body. Consequently, the large number of models houses and ovens, vessels, tablets and stamps consisted human features and emphasized the Neolithic body techniques. The visual culture become a representative of habitus of the first farming societies and the house an institution of body where its symbolic potentials were also promoted. In this manner the dwellings and bodies were furthermore mutually involved through rituals, thus burying mainly dead children and women inside houses and ovens. This paper will be focused on visual and ritual anthropomorphism in the Neolithic Balkans with emphasis on anthropomorphic hybrids and intramural burials.

11 ANTHROPOMORPHISM: A COGNITIVE MODEL FOR THE SOUTH EASTERN EUROPE CHALCOLITHIC

Author(s): Gheorghiu, Dragos (Doctoral School, NUA)

Presentation Format: Oral

If the categories of objects found in a South Eastern Europe Chalcolithic tradition, like vases or anthropomorphic architectural features, were ordered in accordance to their degree of analogy with the human body, one would notice that a rhetoric configuration of the material culture framed by anthropomorphism is to be found in different situations in the archaeological record in a sophisticated and intricate way. The use of human body as main reference for material culture could be explained by the fact that people use familiar concepts in order to explain the unknown.

Historical and ethnographic data support the idea that anthropomorphism is a rhetoric universal. In the 18th century, the philosopher and rhetorician Giambattista Vico (1744) put into evidence the relationship between anthropomorphism and language, and, in the 20th century the philosopher Gilbert Durand (1969), in a, nowadays classical, book identified a rhetoric structure of the anthropomorphic and technomorphic elements of the human imaginary. The analogy between human body and ceramic containers was highlighted by ethnography in different parts of the world, as well as the analogy between the human body and houses and between the human body and a wide range of instruments.

In the Chalcolithic material culture the categories of objects have different degrees of anthropomorphic iconicity; for example there are vases which copy the proportion of the female torso, or vases with definite anatomical details referring to gender. The human body is also represented by anthropomorphic figurines, as well as by miniature objects with anthropomorphic iconicity.

The present paper proposes a cognitive model for the Chalcolithic material culture in accordance with rhetoric rules, insisting on the analogical bases of this rhetoric.

12 SYMBOLISM AND USE OF BIRCH TREE IN THE BRONZE AGE

Author(s): Horáková, Lenka (Via Magna Ltd.) - Jelínek, Pavol (Archaeological Museum - SNM, Bratislava)

Presentation Format: Oral

Birch tree was a part of human environment at least since Upper Paleolithic. Preserved artifacts suggest that birch was used in crafts (including wood, bark and pitch processing), healing, cosmetics and food production. Historical sources mention birch tree in various ritual practices connected with healing, fertility and even shamanic beliefs. Its function was practical and symbolic.

The main objective of this paper is to analyze and interpret birch bark artifacts and their ceramic imitations from the Central Europe, dated to Early Bronze Age. Authors focus primarily on unique finds of birch bark vessels and imitations of earrings found in the famous Otomani culture well dug out in travertine mound in Gánovce. Similar bronze earrings and ceramic imitations of birch bark vessels were found in female burials of Otomani-Füzesaboni and Únětice cultural complexes. The symbolic meaning of birch tree and these artifacts in the context of Bronze Age cultures is interpreted with use of comparative religion and cognitive science. Authors deal with the transfer of symbolic meaning of shapes and color perception. Artifacts made of birch bark are interpreted as associated to feminine sphere of the gender-divided Bronze Age ideology. This connection can be observed also in later periods in written and ethnographic sources, which suggest that birch tree was often anthropomorphized and seen as a woman.

13 THE ENIGMATIC ROLE OF AVIAN ANTHROPOMORPHIC VESSELS IN THE BRONZE AGE CARPATHIAN BASIN

Author(s): Pasztor, Emilia (Türr Istvan Museum)

Presentation Format: Oral

Based on the available archaeological evidence, animals, especially birds appear to have played an important role in the activities and worldview of Bronze Age people in Europe.

The earliest ornitho-anthropomorphic artefact from the Carpathian Basin was discovered in a Late Neolithic cemetery of the Lengyel culture (5th millennium BCE). However, the representation of birds is more characteristic of the Bronze Age rather than of earlier periods. Rich diversity of bird-shaped artefacts bears testimony to increased interest during that time. Represented within the archaeological record are clay vessels, askoi, rattles and figurines more or less visualizing different kinds of birds and there are depictions of birds on bronze or gold objects. The theriomorph vessels appeared again during the last period of the Middle Bronze Age (late 15th and early 14th centuries) in the Carpathian Basin. They often represent birds with human heads or feet or even birds with female breasts.

The presentation investigates the different aspects the mixed ornitho-anthropomorphic artefacts could have serviced in mental control over the social and natural environment.

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14 ANTHROPOMORPHIC IMAGES ON THE BRONZE BELTS FROM THE CAUCASUS IN THE EARLY IRON AGE

Author(s): Hasanov, Zaur (Institute of Archaeology and Ethnography Azerbaijan National Academy of Sciences)

Presentation Format: Oral

During the Early Iron Age bronze belts with anthropomorphic images appear in the North and South Caucasus. These depictions are very rare. Two such belts were found in the Tli burial site in Ossetia. From the burial no. 76 originates a belt with depictions of two anthropomorphic figures. Based on a series of features, including the specific form of the composite Scythian bow and a severed human head hanging from the horse's bridle, V.A. Il'inskaia and A.I. Terenozhkin identify these depictions with the Scythians of the Northern Black Sea region. A bronze belt with the depictions of two anthropomorphic figures originate from a stone box grave in the Dashkasan region of Azerbaijan. Based on a presence of a stone chalice, with a zoomorphic handle, the grave is dated to the eight-seventh centuries B.C.E. The first anthropomorphic figure has no headgear and armed with a composite bow. The second one has a sharp-pointed headgear. In the lower part of its robe there is an appendage reminiscent of a tail. A parallel to this head dress and a robe with a tail originates from the frozen Scythian kurgan in the Verkh-Kal'dzhin-2 burial site in Altai. On all three belts the heads of the people are represented in the form of a bird's head. The lack of a forehead is evident; the nose has the form of a beak. Artists creating these images were trying to stylistically show specific zoomorphic features of the costumes. Here we evidence the junction of anthropomorphism and zoomorphism also recorded on the Scythian costumes from the frozen graves in Altai. (This research has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 734645, "Knowledge Exchange and Academic Cultures in the Humanities. Europe and the Black Sea Region").

CO-ACTING WITH FIGURINES: WOMEN, SHAMANS, AND AMERINDIAN PERSPECTIVISM IN THE ARCHAEOLOGY OF THE LOS ROQUES ARCHIPELAGO, VENEZUELA

Author(s): Antczak, Maria Magdalen - Antczak, Andrzej T. (Faculty of Archaeology, Leiden University; Unidad de Estudios Arqueológicos, Universidad Simón Bolívar)

Presentation Format: Oral

Nearly 400 pottery figurines were recovered during systematic excavations on tiny coral islands of the Los Roques Archipelago located off the Venezuelan coast. These islands were seasonally visited between 1200 A.D. and the time of European conquest by Cariban speaking peoples, archaeologically known as bearers of the Valencioid pottery who lived permanently on the north-central Venezuelan mainland. They were involved in the exploitation of the islands' natural resources, mainly the Queen Conch mollusc (*Lobatus gigas*), marine turtles, and salt. The Valencioid seafarers crossed 135 km in dugout canoes, bringing with them hundreds of figurines, anthropo- and zoomorphic pottery vessels, ocarinas, bone flutes, stone artefacts, oleoresins, and feline skins, among other artefacts. Long-term research has demonstrated that the figurines were closely related to the animated agency of the *Lobatus gigas* mollusc. The human-mollusc interaction on economic grounds was inextricably intertwined with the 'spiritual' life of the Amerindians and the resulting ceremonialism was oriented to protect the island visitors from the anger of the queen conch's protective spirits. Most of feminine island figurines may have metaphorically 'assumed' the ritualistic role of women, standing in as miniature surrogates for the women who were left behind in the mainland settlements. Shamans manipulated them together with other artefacts of ritualistic or shamanic function. The ritual enactment of the social category of women embodied in the figurines in the homosocial insular campsites would indeed prompt the Los Roques seafarers to re-conceptualize their quotidian face-to-face relationships with the 'real' women in the heterosexual contexts of mainland villages. The rituals performed on islands located far from the ancestral homeland and associated with risky endeavours stimulated long-lasting and vivid memories and would have created strong bonds among the members of the task groups necessary to secure high levels of solidarity and cooperation in a hostile insular environment.

BIOARCHAEOLOGICAL APPROACHES TOWARDS UNDERSTANDING DIET AND SUBSISTENCE, AND THEIR ROLE IN THE FORMATION OF EARLY SOCIETIES

Theme: Theories and methods in archaeological sciences

Organisers: Irvine, Benjamin (BIAA - British Institute at Ankara) - Jones, Jennifer (The University of Aberdeen)

Format: Regular session

This session aims to bring together archaeologists from a range of bioarchaeological sub-disciplines researching dietary habits and subsistence practices of prehistoric populations. We are especially interested in researchers using osteoarchaeological, zooarchaeological, palaeoenvironmental, and stable isotope approaches towards answering questions about diet, past agricultural practices and animal management during this crucial period of time.

We encourage papers pertaining to the 5th-2nd millennia BC, a period which sees an intensification and specialisation of agriculture in conjunction with many other important cultural, economical, and societal changes. The differing approaches towards agriculture would have had socio-economical and socio-political repercussions. This period marks the advent of what might be deemed as recognisably 'modern societies', as well as the foundation of urbanisation. Understanding diet and subsistence practices are crucial to understanding the development of increasingly complex societies.

By examining the development of agricultural practices we can gain a better understanding of how populations were organised, in terms of labour divisions and resource provisioning strategies. We can also enhance understanding of how the local environment and climate affected populations and the decision making processes that helped populations counteract these natural factors. This session aims to directly address these issues and bring together scholars utilising contemporary theories and methodologies to approach this stimulating epoch of human development.

ABSTRACTS

A GLACIAL REFUGE IN THE PAYS DE LA LOIRE? AN ISOTOPIC STUDY AT THE SOLUTREAN LEVEL OF THE GROTTA ROCHEFORT

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Presentation Format: Oral

Rochefort cave (Saint-Pierre-sur-Erve, France) is one of the largest caves of the group called "les grottes de Saulges" which are all found along a 1.5 km stretch of the Erve River. Since 2001, an excavation has been carried out in the large chamber which led to the identification of a remarkable Solutrean level with its lithic and faunal assemblages and the presence of art on plaquettes. Stratigraphy and radiocarbon dating give an age between 19,000 and 20,000 BP and the remarkable homogeneity of this unit excludes any possible mix-up with previous or later chronocultures. Fauna and palaeoenvironmental data certify a cold and dry environment during the Last Glacial Maximum (LGM, OIS 2), in which some protected areas favourable to more temperate species still remained. Thus, if reindeer (*Rangifer tarandus*) and horses (*Equus ferus*) dominate in the faunal corpus, alpine ibexes (*Capra ibex*), woolly rhinoceroses (*Coelodonta antiquitatis*), mammoths (*Mammuthus primigenius*), arctic foxes (*Alopex lagopus*), Red fox (*Vulpes vulpes*), wolves (*Canis lupus*), brown bear (*Ursus arctos*), wild cats (*Felis sylvestrus*) and wild boars (*Sus scrofa*) are also found. Araeozoological analysis point to a seasonal hunting camp.

Stable isotopes analysis of bone collagen from a sample of the fauna of this site indicates a variety of environments for the horse, a specialized diet for reindeer and a variation within the usual values for the remaining species. However, stable isotope values depend not only on diet, but also on basal values in soils and vegetation, which in turn depend on climate. In accordance with the paleoenvironmental interpretation, the stable isotopes of the Rochefort fauna do not differ substantially from those of sites further south in the Dordogne, a refuge in the LGM, suggesting the possibility of a seasonal refuge in this northern area, closer to the front of the Arctic ice cap.

02 CARBOHYDRATE-RICH DIETS SUGGEST EARLY FOOD PRODUCTION AMONG MIDDLE HOLOCENE HUNTER-FISHER-GATHERERS IN THE ATLANTIC FOREST

Author(s): Colonese, Andre Carlo (University of York) - Pezo-Lanfranco, Luis - Eggers, Sabine - Petronilho, Cecilia (University of São Paulo) - Toso, Alice (University of York) - Bandeira, Dione (Universidade da Região de Joinville) - dos Santos, Adriana MP - Meyer, Roberta (Museu Arqueológico de Sambaqui de Joinville)

Presentation Format: Oral

Food production has fuelled population growth and the emergence of social complexity in pre-Columbian South America, from the Andes to lowland regions of the continent, leaving a longstanding legacy in regional biodiversity, cultural landscapes and traditional knowledge. However, the nature, time and place of early plant cultivation and the development of independent centres of food production in the tropics are still matters of debate. The narrow coastal strip of the Atlantic Forest, one of the world's most diverse tropical biomes, has supported human societies since the Middle Holocene, but their interaction with plant resources is still poorly understood. As a result, this region has been marginal to debates around the origin of plant management and cultivation, and the impact of these practices on forest composition and diversity in the tropics.

We present oral pathology and stable isotope evidence of carbohydrate-rich diets for Middle Holocene hunter-fisher-gatherers along the Atlantic Forest coast of Brazil. A diversified economy with substantial consumption of plant resources took place in sites at Babitonga Bay (Santa Catarina state), which supported a dense population at ca. 4,500 cal BP. A high proportion of dietary carbohydrates was inferred from stable isotope analysis and the presence of carious lesions in several individuals compatible with a high cariogenic diet, which is unique when compared with other contemporary and later groups in the region, including peoples who used ceramics and domesticated crops. The results are corroborated by independent dietary evidence, such as plant microremains in dental calculus, which together support the growing body of evidence that food production took place in the Atlantic Forest coast in the Middle Holocene.

03 THE FIRST DEMOGRAPHIC TRANSITION IN LATVIA

Author(s): Zarina, Gunita (Institute of Latvian History at the University of Latvia)

Presentation Format: Oral

The first demographic revolution (known also as Neolithic revolution) is associated to emergence of farming, transition to permanent settlements, improvement of tool efficiency, development of labor division – all that resulting in improved availability and security of nutrition.

The objective of this presentation is to provide an insight into processes of the first demographic transition in Latvia and their timing on the basis of paleodemographic and stable isotope analysis data of Stone age population. Summary of data on life quality and duration of Stone age population indicates low fertility rate in the Mesolithic and increase of it in Neolithic, just as is typical in other Nordic hunter-gatherer populations. Female life expectancy in Mesolithic exceeds male; occurrences of rich female burials suggest important social status.

In Neolithic, decrease both in age of the first child-bearing (possibly, down to 16-18 years) and in female life expectancy are obvious. The first attempts to determine duration of breast-feeding in Stone age by means of stable isotope analysis demonstrate high dependency on individual nutrition habits, consumption of fresh-water fishes, presence of famine periods. It seems, that in Mesolithic weaning occurred at the age of 3. Stable isotope analysis suggest decrease of weaning age to 1.5 – 2 years in late Neolithic. That

might be result of emergence of farming.

In order to improve certainty of results, further research of stable isotope contents should include bigger number of individuals; anthropological material from other Stone age sites besides Zvejnieki should be included.

04 FINDING FARMERS: SUBSISTENCE STRATEGIES OF THE LATE NEOLITHIC ABORA SETTLEMENT INHABITANTS, SOUTH-EASTERN LATVIA

Author(s): Legzdina, Dardega (Institute of Latvia History, University of Latvia)

Presentation Format: Oral

Abora settlement is located in South-eastern Latvia at the Lake Lubāns wetland approximately 200 km from the Baltic Sea. One of the 27 Lubāns' Stone Age sites, the Abora stands out with its many human burials, distributed within the settlement cultural layers. Archaeological research and excavations at the site took place in the 60s and 70s, and once again in 2008, when new radiocarbon dates of organic samples became available (~2940 - 2470 BC).

Although the archaeological and zooarchaeological material suggests that the Abora people were familiar with animal husbandry and early farming, so far the carbon and nitrogen stable isotope analysis have not confirmed farming as a significant subsistence strategy. Moreover, 13 human samples, 6 of them radiocarbon dated, show a dietary shift during the Late Neolithic from mixed freshwater/terrestrial towards more freshwater based diets.

The research of the Abora people is now continuing with 20 new carbon and nitrogen stable isotope analysis of the Late Neolithic human samples. The aim is a better understanding of the complex transition process towards farming in the Late Neolithic Latvia. Plausible interpretations of the human data are possible due to the large amount of faunal carbon and nitrogen isotope data from the Lake Lubāns wetland (43 herbivore, omnivore, carnivore and fish samples).

05 WHAT DOES THEIR RUBBISH TELL ABOUT THEIR DIET? PLANT AND ANIMAL REMAINS FROM THE LATE NEOLITHIC SITE OF ZÜRICH-PARKHAUS OPÉRA

Author(s): Antolin, Ferran (Integrative Prehistory and Archaeological Science, University of Basel) - Bleicher, Niels (Centre for Underwater Archaeology and Dendrochronology, Office for Urbanism, Zürich) - Doppler, Thomas (Integrative Prehistory and Archaeological Science, University of Basel; Archaeological Service, Kanton Aargau) - Gerling, Claudia - Schäfer, Marguerita - Schibler, Jörg (Integrative Prehistory and Archaeological Science, University of Basel) - Steiner, Bigna (University Paul Valérie Montpellier 3) - Jacomet, Stefanie (Integrative Prehistory and Archaeological Science, University of Basel)

Presentation Format: Oral

Anthropogenic deposits consisting in organic detritus found in wetland sites have a unique interpretative potential thanks to their extraordinary preservation conditions.

Such deposits were found at the lakeshore site of Zürich-Parkhaus Opera (Switzerland, dendrodated to ca. 3165 BC). A systematic sampling strategy allowed the recovery and identification of over 200'000 plant remains and 15'000 animal bone fragments. The data was used to estimate the total amount of plant and animal remains found at the site and eventually calculate the hypothetical caloric contribution of each type of resource to human diet. It is the first time that such calculations are possible at the scale of a village.

Our initial calculations showed a great importance of the plant resources in the diet (ca. 80% of the total calories), with a very high contribution of wild plants (up to 50% of the total calories), while domestic and wild animals would contribute ca. 14 and 7% each. The implications of such an economic system on the immediate environment would be considerable. The local landscape would not naturally provide this amount of wild fruits to be consumed, which means that an intensive landscape management was practiced during generations in order to keep the productivity of these trees at the desired level. These results are also coincident with dendrological analyses from sites located in Lake Zürich.

For this presentation we include the final analysis of archaeobotanical samples (ca. 100 new samples) with the aim of providing a better and final calibration of the relative contribution of wild and domestic plants to human diet. In addition to this, the few human bones that were found at the site were sampled and are currently being chemically analysed in order to contrast the above-mentioned results with the stable isotope values. Both types of proxies will be compared and discussed.

06 DIET PREFERENCES IN THE NEOLITHIC AND THE EARLY BRONZE AGE SOCIETIES FROM SOUTH-EASTERN POLAND

Author(s): Szczepanek, Anita (Institute of Archaeology and Ethnology, Polish Academy of Sciences; Jagiellonian University Medical College) - Jarosz, Paweł (Institute of Archaeology, Adam Mickiewicz University in Poznań) - Włodarczak, Piotr (Institute of Archaeology and Ethnology Polish Academy of Sciences)

Presentation Format: Oral

Reconstruction of paleodiet concerned the Neolithic and the Early Bronze Age societies which occupied the south-eastern Poland from the 4th to 2nd millennium BC. We analysed variability in the diet preferences between groups of the different subsistent strategies. Selected samples represented human and animal osteological material of different archaeological cultures: the Baden culture,

the Funnel Beaker culture, the Globular Amphora culture, the Corded Ware culture, the Bell Beaker culture and the Mierzanowice culture. The diet reconstruction was based on $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ stable isotopes analyses and the archeozoological material. Comparison of these data enabled us to find similarities and differences within analysed societies and between them. There were no significant gender differences in dietary intakes. Generally values of human $\delta^{13}\text{C}_{\text{coll}}$ ranged around -20‰ so they are typical for humans living in inland temperate environments and having a terrestrial diet based on C3-plant and animal resources. Moreover the $\delta^{15}\text{N}_{\text{coll}}$ values, from about 10 to 11.4 ‰ , indicate that freshwater fish did not contribute to diet. The offset of +3–4 ‰ in human $\delta^{15}\text{N}$ values in comparison to herbivores and the omnivore animals corresponds to a difference of one trophic level. Differences between analysed societies were subtle but mobile groups were more variable.

The project is currently realized (National Science Centre, Poland, NCN 2015/19/B/HS3/02149 and 2016/20/S/HS3/00307).

07 IRONAGECHEF: EXPLORING COOKING PRACTICES THROUGH TRANSMISSION ELECTRON MICROSCOPY ANALYSIS OF BONE COLLAGEN FROM PREHISTORIC FEASTING SITES IN BRITAIN

Author(s): Faillace, Katie (Cardiff University) - Foody, M. George B. (University of Huddersfield) - Madgwick, Richard (Cardiff University)

Presentation Format: Oral

This paper presents results from a pilot study that explores the utility of Transmission Electron Microscopy analysis of bone collagen for investigating cooking in prehistory. Approaches to cooking practices have long relied on artefactual evidence, modifications on bone, and more recently organic residue analysis. However, direct evidence for cooking of bone has been limited. Richter (1986) and Koon (2003, 2010, 2012) have successfully applied Transmission Electron Microscopy analysis of collagen to determine heating to modern and medieval bones, however, this method has yet to be tested for prehistoric remains which may have poorer preservation.

Collagen will denature at relatively low temperatures, such as those achieved by roasting, boiling, or baking. The denaturation of collagen causes predictable structural changes that can be viewed through a Transmission Electron Microscope. Zooarchaeological remains of sheep and pig with minimal taphonomic changes were analysed from four Later Prehistoric (c. 800-500BC) sites in Britain (n=33). Humeri and phalanges were selected to compare elements with high and low meat yields. Although preliminary, the results of this investigation are promising for the method's application on prehistoric material. Humeri and phalanges generally expressed similar levels of denaturation, suggesting bones (as well as meat) from both high and low meat yield elements were being treated in similar ways. Variable patterns of treatment were, however, observed between different sites and taxa.

Foodways are increasingly recognized as an important cultural marker, both in terms of understanding domestic and ritual practice in the past. However, the study of cooking practices, particularly relating to bone, has often been neglected, partially due to the limits of approaches to analysis. This preliminary study demonstrates the potential of this method for exploring prehistoric cooking practices and can provide a springboard for wider studies.

08 LATE NEOLITHIC DIET IN THE CANTABRIAN REGION (NORTHERN SPAIN): A BIOARCHAEOLOGICAL APPROACH

Author(s): González Rabanal, Borja (Instituto Internacional de Investigaciones Prehistóricas de Cantabria) - Jones, Jennifer (School of Geosciences, University of Aberdeen) - Marín Arroyo, Ana Belén - Gutiérrez Zugasti, Igor - González Morales, Manuel Ramón (Instituto Internacional de Investigaciones Prehistóricas de Cantabria)

Presentation Format: Oral

Stable isotopes analysis of human remains, in addition to osteoarchaeological analysis, can provide valuable information about the diet and lifeways of early farming populations. In the Cantabrian Region the scarcity of human remains from the Neolithic period in the region has limited our understanding of the economies of the first farmers in this region. Recent excavations in the region have provided a small record of human remains, dating to the Late Neolithic period.

This paper focusses on two sites from central Cantabrian Region: El Toral III rockshelter (Asturias) and Los Avellanos cave (Cantabria). El Toral III is a rockshelter where a cist burial was discovered, associated with human bones, although most of the human remains were found outside of structure due to disturbances of the deposit. Excavations at Los Avellanos cave revealed a surface deposit of disarticulated human bones. Four individuals from El Toral III and two from Los Avellanos were sampled for carbon and nitrogen stable isotope analysis for dietary reconstruction, in addition to osteological analysis to understand more about the individuals interred at these sites.

Results reflect a predominantly terrestrial diet. The main contribution of calories to the diet was from animal protein, likely meat or milk due to the higher $\delta^{15}\text{N}$ values in relation to herbivore fauna baseline. Vegetal resources (C3 plants) also had a significant role in the diet of first farmers in this region. The $\delta^{13}\text{C}$ values demonstrate that marine resources were not being consumed by Late Neolithic populations in the region, despite proximity of these sites to the coast.

Palaeodietary analysis helps to understand the emergence of the first farming societies and the end of hunter-gather lifestyle in Northern Spain. Further work is needed, especially studying Early Neolithic human remains, to enhance our understanding of the Neolithization process in the Cantabrian Region.

09 INVESTIGATING PREHISTORIC DIET AND LIFEWAYS OF EARLY FARMERS IN CENTRAL NORTHERN SPAIN (3000-1500 CAL BC) USING STABLE ISOTOPE TECHNIQUES

Author(s): Jones, Jennifer (University of Aberdeen) - Marín-Arroyo, Ana B. (IIIPC, Universidad de Cantabria) - Vega Maeso, Cristina (Servicio Territorial de Cultura de Valladolid) - Carmona Ballester, Eduardo (Servicio Territorial de Cultura de Valladolid; Área de Arqueología. Universidad de Burgos)

Presentation Format: Oral

Reconstructing the past dietary behaviour, and agricultural practises of prehistoric early farmers from Central Northern Spain, is key to understanding the circumstances surrounding the emergence of social complexity in this region. This paper explores the NE area of the Castilian Plateau to Cantabrian coast between 3000-1500 cal BC, a period which sees the growth of settlements, changing burial practises, and the formation of the first societies.

Human remains from recently excavated sites (Abrigo de la Castañera in Cantabria and Arroyal I, El Hornazo, Fuente Celada and FF.CC.-La Dehesa in Burgos) were sampled for stable isotope analysis ($\delta^{13}C$, $\delta^{15}N$, $\delta^{34}S$) to explore past diet of these early farming populations. The human remains derived from a range of burial contexts including pit graves, megalithic monuments and burial caves. Animal bones were also studied to provide initial insights into animal management during this timeframe. In total 52 samples were analysed, including 17 different humans and 35 animal specimens (cattle, sheep, pig, red deer and dog). Results show that humans at all sites consumed relatively similar diets, comprising of C3 crops, and animal protein. Animal management patterns indicate a use of the wider landscape, as expressed by the wide ranging $\delta^{13}C$ and $\delta^{15}N$ values observed. The differing diets of dogs at El Hornazo, gives insights into the relationship of humans and dogs, potentially reflecting working animals versus household pets. The $\delta^{34}S$ values of two individuals from Arroyal I suggests that they came from different regions, implying a level of inland mobility.

10 LIFE IN THE MARGINS: A BIOARCHAEOLOGICAL APPROACH TO STUDYING HUMAN ADAPTATION STRATEGIES IN THE PREHISTORIC CENTRAL TIAN SHAN

Author(s): Motuzaitė Matuzevičiūtė, Giedrė (Vilnius University)

Presentation Format: Oral

Over the past decade, bioarchaeological research has greatly increased our knowledge on the geographical origins and timing of arrival of the first agro-pastoralists and their domesticates in Central Asia. The array of animal and plant species under domestication by 2500 BC originated both in southwest Asia and China. This “agricultural package” allowed exploitation of the highland valleys of Central Asia and networks of interaction to be formed, laying the basis for the development of the Silk Road and the formation of complex societies in the region. Little research has been done, however, on understanding the subsistence strategies adopted by humans and their domesticates in the new environmental niches of the continental climate of Central Asia. The geographically marginal zones such as the high mountain valleys of Central Tian Shan, which separate China and Central Asia, are of particular interest, as their climatic conditions are the harshest. Thus, the environmental conditions in these mountain zones had a great influence on the timing of crop dispersal, species selection, development of their morphotypes, and which species were dispersed over which timeframes further on to lower altitudes and latitudes.

With the application of bioarchaeological research techniques this talk presents the analysis of human subsistence strategies in these high altitude zones of the Central Tian Shan of Kyrgyzstan during the Bronze Age (ca. 2500 – 1000 BC). We aim to explain why only certain crop and animal species were selected upon in the mountain geographical margins and how this might have affected the further picture of domesticated crop and animal distribution during the earliest stages of their dispersal across Eurasia.

11 DOMESTICATING THE MOSAIC: STABLE ISOTOPE APPROACHES TO AGROECOLOGIES IN SOUTH ASIA

Author(s): Nayak, Ayushi - Petraglia, Michael - Boivin, Nicole - Roberts, Patrick (Max Planck Institute for the Science of Human History)

Presentation Format: Oral

The emergence of agriculture is seen as a major ecological threshold in terms of human adaptations and impacts on the world. Yet, despite being one of the most populous regions of the world, South Asia has been neglected in these discussions until relatively recently. Where archaeological research has sought to study agriculture in South Asia, the focus has been on identifying indigenous centres of domestication, or the cultural and subsistence impacts of population movements. Research into the actual practice and experience of agro-ecologies across the mosaic of environments of this region has been absent. Stable isotope analysis of botanical faunal, and human remains has recently developed, in Europe and the Middle East, as a means of reconstructing local farming practices and ecologies. This includes reliance on particular crops, animal foddering and herding practices, and even crop growing conditions, such as manuring or irrigation. Here, we apply this approach to sites spanning the 3rd to 1st millennium BC, and different eco-geographical zones in the Indian subcontinent. The results highlight changes in management practices over space and time, and provide new insights into crop packages and behaviours. We argue that this holistic, scientific approach offers, for the first time, the possibility of integrating subsistence data with evidence for landscape modification, palaeoenvironmental change, and social contexts in one of the most linguistically, genetically, and culturally diverse parts of the world.

12 ISOTOPE ANALYSES: HUMAN BEHAVIORS VERSUS ENVIRONMENTAL CONDITIONS

Author(s): Depaermentier, Margaux (Freiburg University)

Presentation Format: Oral

Retracing dietary habits and subsistence strategies of past human societies are important fields of archaeological research for each period. It involves specialists of disciplines coming from both humanities and natural sciences. Among the latter, isotope analyses are playing an increasingly role. Stable carbon and nitrogen isotope analyses are mainly used in dietary reconstructions, especially in light of social differences, as human $\delta^{15}\text{N}$ values are supposed to be mostly influenced by the protein intake amount. Van Klinken et al. 2000 suggested that environmental parameters were the main factor of fluctuation in human $\delta^{13}\text{C}$ values, so that isotope analyses can also apply to reconstruct past environmental conditions. The combination of both factors leading to the possibility of estimating husbandry management, for which strontium isotope analyses also play a great role. However, the many options to use and interpret isotope data show that they are ambiguous and that the results could depend on research target. This paper bases on isotope data from early medieval sites in Europe – a period of transition for which research is often influenced by historical and political events. First objective is to determine for what purpose isotope analysis are mainly used. The second is to contrast their interpretation with environmental, zooarchaeological and further archaeological data in order to consider to what extent other narratives could apply for the same database.

a. CONTAMINATION OF CERAMICS WITH RECENT PROTEINS IS A CHALLENGE FOR MOLECULAR ARCHAEOLOGY

Author(s): Pavelka, Jaroslav - Šmejda, Ladislav (University of West Bohemia)

Presentation Format: Poster

We proposed a novel methodological approach to detect and differentiate between cooked and uncooked animal meat protein in archaeological samples. We tested two groups of materials: ceramic mass of vessels dated to the early medieval period (9th-10th centuries CE) and soil samples collected from the same stratigraphic layer that yielded these pottery fragments. Using an ELISA immunological test designed to identify cooked pork, we found that pig proteins were present in the studied pottery specimens, but the surrounding soil contained only uncooked pig proteins. We interpret this observation in the sense that the ceramic vessels did serve for cooking pork in the historic times. Pig proteins identified in soil matrix are of different origin, however, and represent probably contamination from dung, dropped by wild pigs living in the area of the sampled archaeological site until the present day. This study opens a new perspective of dealing with the complexities of research into archaeological biomolecules, suggesting that typical study sites may contain a mixture of ancient raw and artificially processed proteins as well as original protein content plus secondarily introduced/contaminating proteins (and other types of biomolecules) of the same species. To avoid confusion of these diagenetically distinct categories in archaeological interpretation, it is necessary to pay a close attention to new methodologies, which can help their separate identification.

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ISSUES ON THE ARCHAEOLOGY OF JEWISH CEMETERIES: URBAN DEVELOPMENT, HERITAGE PRESERVATION AND RISK MANAGEMENT

Theme: Archaeology and the future of cities and urban landscapes

Organisers: Blanchard, Philippe (INRAP - Institut National de Recherches Archéologiques Préventives; UMR 5199 PACEA, Bordeaux; EHESS - Ecole des Hautes Etudes en Sciences Sociales, Paris) - Ruiz Taboada, Arturo (Complutense University, Madrid) - Maese Fidalgo, Xavier (Institut de Cultura de Barcelona, Servei d'Arqueologia)

Format: Session with precirculated papers

The development of preventive archaeology in Europe since the 1990s has made it possible to take better account of the archaeological heritage and has contributed to a renewal of knowledge, particularly for medieval urban society. Among these remains, our present city centres sometimes deliver the remains in connection with ancient Jewish communities, especially cemeteries. The discovery of these structures is relatively rare in Europe and should be considered as an exceptional opportunity to acquire new data other than those from textual, iconographic or museographic sources. However, the uncovering of historic Jewish tombs entails significant constraints, including the reaction of some of the most extremist Jewish groups and authorities. In fact, under the pretext of Jewish laws, they oppose all forms of archaeological intervention on their ancestors, contravening the current cultural heritage laws of each country. We might also discuss the management of these human remains; focus on research, heritage and tourist possibilities among others.

This session is therefore intended to analyze known and recent archaeological works on Jewish medieval cemeteries in Europe. The objective is to present the site (location, excavated area, number of tombs, funerary and chronological features, anthropological studies, etc.), the constraints encountered with local Jewish communities and the different ways of disseminating data and promoting this urban religious heritage (exhibitions, conferences, publications, museum space, etc.).

01 ARCHAEOLOGY AND HERITAGE MANAGEMENT OF JEWISH CEMETERIES IN EUROPE

Author(s): Maese Fidalgo, Xavier (Servei d'Arqueologia de Barcelona - ICUB) - Blanchard, Philippe (INRAP) - Ruiz Taboada, Arturo (Universidad Complutense de Madrid)

Presentation Format: Oral

The societies have observed their existence reflection on the death. Independently of their religion, the funerary world has more to do with the social, familiar and religious context than with the deceased himself/herself. This way, over time, we have seen a great number of ways to understand the death, rituals, customs and burial ways. The historical texts are an essential source to know the death, although the archaeology is the only one able to precise about details, styles and superstitions.

Controversy caused by the archaeological excavation of Jewish cemeteries all over Europe might alter the human remains management. The exhumation of Jewish tombs saw the involvement of its international community in an issue that solely concerns the local authorities to which the remains belong. We discuss this controversy surrounding the treatment of this type of remains and possible solutions.

The aim of this session is therefore to present different excavations of Jewish cemeteries in Europe. Debates will also be held on the clues for linking these funeral spaces to the Jewish community with a discussion of the Jewish funeral practices identified. Possible ethical and religious problems encountered during excavations will be discussed in order to see the implications and how archaeologists and local/regional administration have attempted to address them. We also hope that the ways in which the scientific results and vestiges have been disseminated and valued to the scientific community and the public respectively will be discussed.

02 INVENTORY AND EVALUATION OF ARCHAEOLOGICAL INTERVENTIONS ON MEDIEVAL JEWISH CEMETERIES IN EUROPE

Author(s): Blanchard, Philippe (Inrap; UMR 5199 PACEA; EHESS) - Gardère, Philippe (Inrap; UMR 7324)

Presentation Format: Oral

Since the modern period, discoveries of medieval funerary remains related to Judaism in Europe have begun to appear. In particular, it is the uncovering of epigraphed stelae that most often caught the attention of some specialists who proposed translations. The indications or studies of bone remains have remained more discreet. The first bibliographical works or references on these subjects seem to appear during the 19th century and reveal the curiosity of some scholars in this field. However, it was with the development of preventive archaeology in the late 1980s that archaeological interventions on Jewish cemeteries increased.

The proposed communication will attempt to present an inventory of the various human interventions on medieval Jewish cemeteries in Europe, focusing on those that have provided bone remains. The aim will be to map out the different sites while proposing a discussion on the prospects for studying these cemeteries through the available data. This will analyse the number of tombs excavated and studied as well as the number and type of publications or valorization (scientific or general public) of these funerary ensembles. The aim will be to identify the best documented and most reliable sites in order to understand the organization of Jewish cemeteries and the funeral practices of these medieval communities.

03 THE JEWISH NECROPOLIS OF MONTJUÏC (BARCELONA): PAST, PRESENT AND FUTURE

Author(s): Maese Fidalgo, Xavier (Servei d'Arqueologia de Barcelona - ICUB) -Subirà i de Galdàcano, M. Eulàlia (Universitat Autònoma de Barcelona) - Casanovas Miró, Jordi (Museu Nacional d'Art de Catalunya)

Presentation Format: Oral

In 2014 the Archaeological Service of Barcelona (ICUB) started a new interdisciplinary research project on the Jewish necropolis of Montjuïc (S. IX-XIV), in order to increase the knowledge of this valuable heritage element and archaeological site of the city and also, of the Jewish community of medieval Barcelona. The Jewish necropolis of Montjuïc is located on the north-eastern slope of the homonymous mountain, and controlled medieval Barcelona, at least, between the 9th and 14th centuries. In 1945 and 2001 were carried out two archaeological excavation campaigns, that allowed the documentation of more than 700 graves, and several tombstones with epigraphy.

The project intends basically, to update the current state of the investigation, as well as open new ways of research, from the study of various sources, such as written, epigraphic, cartographic, photographic and archaeological, with the participation of the respective specialists in each subject -historians, documentalists, archaeologists, anthropologists, epigraphers. The main objective is to unify all the documentation and available sources, to better define the historical and archaeological information of the necropolis, whether chronological, anthropological, spatial, typological, social or ritual data. The latest anthropological studies have shown that the Jewish Montjuïc group differs from contemporaneous Barcelona ones in some biological aspects as cranial morphology, but also a better state of health and quality of life considering the general population of the period, very likely a consequence of the benefits from the middle-high class, as indicated in the documents. The real extent of the cemetery has drawn a special interest for various reasons but principally, to be able to safeguard and protect it properly, as it will allow preventive intervention more effectively. The main goal of this project is to consolidate the capital importance of the necropolis of Montjuïc, element that cannot be detached from the history of Barcelona.

04 ROQUETES SITE: NEW APPROACHES TO THE 1348'S RIOT

Author(s): Saula, Oriol (Museu Comarcal de l'Urgell) - Subirà i de Galdàcano, M. Eulàlia - O. Clausell, Adriana (GRAPAC unitat d'antropologia biològica Universitat Autònoma de Barcelona) - Colet, Anna (Museu Comarcal de l'Urgell)

Presentation Format: Oral

The excavation of Roquetes archaeological site started in February 2007. The campaign lasted until its month of September after the digging and documentation of 182 individual graves and 6 common graves found at the south-east area of the site. Information found in the 1501 llibre d'estimes showed that the site could correspond to the Hebrew population's cemetery, a hypothesis that was confirmed as two rings with Hebrew inscriptions were unveiled. Inside the 6 mass graves excavated, 69 individuals were found - even though only four of them were completely excavated. A percentage of those individuals had been dressed when buried allowing the relative dating of the remains thanks to the presence of 14th century coins. The association of the remains to the 14th century was posteriorly validated with the C14 dating. The presence of 14th century coins and violence marks on some individuals, cleared the fact that the site was related to the 1348 riot extensively detailed in the century's documents. Anthropological studies have shown the demography and a possible reconstruction of the attack. Ten individuals showing signs of violent death were analyzed to acquire information about the wounds (shape and type). The study started with a naked eye analysis of the wounds to make and inventory. Then, the profiles of the wounds were obtained using a reflection confocal profiler to gather information about depth and width. The wound not suitable for this analysis were described using photos and analysed using a specific software. Using this information, we described the wound and hypothesize the aggression sequence in each individual.

05 THE MEDIEVAL JEWISH CEMETERY, TOLEDO: PAST AND PRESENT ROLE

Author(s): Ruiz-Taboada, Arturo (Complutense University Madrid)

Presentation Format: Oral

The Jewish presence in the Iberian Peninsula dates back to Roman times and is characterized by a centuries-long alternation of light and shadow, until their expulsion from Spain in A.D. 1492 and Portugal in A.D. 1496. During the middle ages, the tensions with the general population and with the ruling classes that had characterised previous eras increase exponentially. The disaffection with all things Jewish favours both the massive conversions to Christianity that will characterize the 14th and 15th centuries, which will result in the expulsion decrees.

There have been very few Jewish cemeteries identified in the Iberian Peninsula considering the importance that this community had throughout a long period of history. The common denominator of these sites is the absence of any material record that clearly relates them to the Jewish world. The edict of expulsion in 1492 caused these places to remain forgotten in time. In recent decades, urban development and construction in cities, but also in small towns, is bringing to light a forgotten funeral landscape that gave character to these localities, where, for many centuries, Muslims, Christians and Jewish were all significant elements of the population.

The medieval Jewish cemetery of Toledo was recently rediscovered in year 2008. The recovery of lost cultural traditions of societies that still exist today can be complicated though. Funerary archaeology is becoming one of the main sources of information to learn about the lives of historical Jewish communities. However, its study might cause controversy among some parts of the modern Jewish community. Toledo, among other cemeteries all over Spain and the rest of Europe, illustrates this controversy.

06 THE JEWISH CEMETERY OF LOS SANTOS PINTADOS IN CORDOBA

Author(s): Hiedra Rodríguez, Enrique (Universidad de Córdoba; Cordoba Near Eastern Research Unit - CNERU)

Presentation Format: Oral

In 2008, the hebrew gravestone of Yehudah Bar Akon (845 A.D) was discovered in Cordoba, in the area next to where Évariste Lévi-Provençal had located the Jewish cemetery of the Islamic era that was mentioned in Arab sources. The existence of a set of tombs typologically compatible with the Jewish rite in the archaeological sites adjacent to the site of the discovery led us to suggest, right from the start, the identification of these tombs as the early medieval Jewish cemetery of Córdoba.

In our paper we will present and analyze the different archaeological remains belonging to this funerary complex in the light of the current typological model of Jewish funerary archeology in the Peninsula. However, given that said typological model is based on data from lower-medieval Christian Spain, would it be suitable to diagnose a Jewish cemetery with such an early chronology within Andalusian territory? Could this lack of archaeological remains of Andalusian Jewry be due to an inappropriate interpretive model, unable to recognize them? Our case, together with that of Lucena, opens the possibility to rethink this issue as well as to elaborate, if necessary, a new, specifically Andalusian, interpretive model. Finally, we will present some circumstances related to the development of popular religiosity in the surroundings of our cemetery leading us to open some very suggestive lines of research on this issue.

07 ARCHAEOANTHROPOLOGICAL STUDY OF THE MEDIEVAL JEWISH CEMETERY OF BOLOGNA (ITALY): AN INSTRUMENT OF CULTURAL HERITAGE VALORISATION AND MEMORY CONSTRUCTION

Author(s): Belcastro, Maria Giovanna (Dept. of Biological, Geological and Environmental Sciences - University of Bologna; Aix Marseille Univ, CNRS, EFS, ADES, Marseille) - Curina, Renata - Di Stefano, Valentina (Soprintendenza Archeologica - SABAP Bologna) - Mariotti, Valentina (Dept. of Biological, Geological and Environmental Sciences - University of Bologna; Aix Marseille Univ, CNRS, EFS, ADES,

Marseille) - Pietrobelli, Annalisa - Sorrentino, Rita (Dept. of Biological, Geological and Environmental Sciences - University of Bologna) - Rizzo, Valentina (Soprintendenza Archeologica - SABAP Bologna) - Modi, Alessandra - Lari, Martina - Caramelli, David (Dept. of Biology - University of Florence)

Presentation Format: Oral

The aim of the work is to present preliminary archaeological and anthropological results of the study of a Medieval (14th-16th c.) cemetery with more than 400 burials excavated in Bologna (Italy) during 2012-2014 by the Archaeological Superintendence. The cemetery presents features that distinguish it from coeval funerary assemblages (burial typology; W-E orientation; spatial organization; regular layout in rows of the primary and single inhumations without superimpositions; supposed disturbed post-depositional human intervention). The historical archive sources indicate its pertinence to the Jewish sphere, also evident when compared to other coeval European contexts. With Jewish Community of Bologna, constantly involved in the research, we have worked in the attempt to extensively study the archaeological, anthropological and cultural contexts and to reconstruct the social organization of that medieval Jewish community.

The biological anthropological study dealt with the reconstruction of life style (health, diet, etc.) and the origin of the medieval community. The cultural anthropological approach investigates the historical value of the cemetery, as a potential instrument to evoke and to reconstruct the memory. Therefore the integrated archaeological, biological and cultural anthropological methodologies may reveal some of the historical, social and biological dynamics of the Jews in Bologna. This approach allows redefining the heritage of the Jewish culture, the legacy between that medieval Jewish community and the modern one, also giving an important component of the Cultural Heritage to the city. Finally this approach aims at contributing to widen the academic discussion on shared solutions to valorize cultural heritage.

08 A NORMAN NECROPOLIS WITH MIXED RITUAL IN PALERMO

Author(s): Battaglia, Giuseppina (Soprintendenza BB.CC.AA. di Palermo) - Miccichè, Roberto (Università degli Studi di Palermo)

Presentation Format: Oral

From September 2013 to June 2015, the Palermo Soprintendenza has followed the works for the construction of the new tram line in Corso dei Mille, still today one of the main access roads to the city centre. The area is bordered to the South by Admiral Bridge, built around the second quarter of the 12th century and to the North by Termini Gate, now destroyed.

It has been identified part of a necropolis that presents particular characteristics, among which two funerary rituals and a total absence of personal ornaments. The tombs, placed on a single level, are aligned and do not overlap; several tombs lay and cut some previous walls of Islamic age, and are covered by a road that could be related to the Admiral Bridge and Termini Gate, probably dating back to the end of the 12th - 13th century. All burials respect the EW orientation with the head to the West. In 23 cases, the dead, placed inside a wooden box, is in a supine position with the lower limbs stretched out and the upper limbs along the body or on the pubis or in some cases bent on the abdomen. Four deads were laid down - without wooden casing - in a right side decubitus, facing SE, according to the Islamic rite. Finally, two tombs have a pit dug into the rock, lined and covered by lithic slabs, some with traces of plaster, placed in a double slope and the dead is placed on his back in a wooden case. Only in one of the 23 deads in supine position was found a bottle for perfume in white and cobalt blue glass (12th century about). In this area, written sources from the 14th century place the Jewish necropolis.

09 JEWISH FUNERAL SPACES AT THE HÔTEL-DIEU OF LYON (18TH CENTURY, FRANCE). DEAD OF YESTERDAY, COMMUNITIES OF TODAY

Author(s): Ruiz-Taboada, Arturo (Complutense University Madrid) - Bouvard-Mor, Emma - Puel, Olivia (Service archéologique de la Ville de Lyon, laboratoire ArAr „Archéologie et Archéométrie“ - UMR 5138)

Presentation Format: Oral

Definitively an urban site, the hôtel-Dieu has played a major health and social role in Lyon since the Middle Ages. Located at the entrance to the city, it became in the 16th century, by the will of the consuls, the city's main hospital center, housing numerous burials for patient population. Furthermore, at the Modern period, it housed cemeteries for protestant and, later, jewish populations, which were excluded from parish cemeteries.

This establishment still operated as a hospital until its disaffection in 2010. As part of its rehabilitation, Lyon City Archaeological Department intervened to carry out preventive archaeological operations from 2011 to 2017, by order of the State. Several funerary areas have been excavated. Dated from the 14th to the early 19th century, the individual and collective graves we could study rise the number of two hundred dead people (which may represent only the third part of the entire sepulchral potential of the site). Among them, two locations were known to be dedicated to the Lyon Jewish community during the 18th century.

Forgotten from a long time ago, their existence has questioned the way how leading the building project, and therefore, the archaeological operation which were associated. This communication intends to describe the conditions of intervention and the results obtained during the successive excavations of these two funeral complexes. It will highlight the evolution of measures taken with regard to cultural and religious sensitivities and will examine the data on which the memory identity of places has been recomposed.

10 THE HUMAN SKELETAL REMAINS: RES OR PEOPLE?

Author(s): Belcastro, Maria Giovanna - Mariotti, Valentina (Dept. Biological, Geological and Environmental Sciences - University of Bologna; Aix Marseille Univ, CNRS, EFS, ADES, Marseille)

Presentation Format: Oral

The study of the human skeletal remains deals with the reconstruction of past communities from the evolutionary and bioarchaeological perspectives. The effort of the scientific anthropological community is to show their informative potential as historical documents. Only recently the archaeologists emphasized the meaning of the human skeletons in the funerary contexts.

However, whereas the value of the study of prehistoric human fossils (very far from us) is largely accepted, the same does not always happen for more recent human skeletons. The study and management of human remains is explicitly opposed by ultraorthodox religious groups, but also other parts of the society (private individuals, sometimes the academic institutions) show toward this issue feelings of disregard and disappointment. The core of the issue is the unclear and undefined position of the human (skeletal) remains from archaeological contexts within the scientific collections as well as the cultural heritage, given their scientific and cultural relevance. In fact, they should belong to both, giving their mix of biological and cultural meaning. However in Italy only the cemetery legislation may actually regulate their management. No specific rules of the Code of the Cultural Heritage explicitly include human remains, excluding them, de facto, from the cultural heritage. This leaves the field open to conflicting attitudes (also among institutions) in their management (study, valorization, exhibition, etc.).

To summarize: are the human remains res or people?

11 JEWISH CEMETERIES AND ARCHAEOLOGY : RELIGIOUS LAW VERSUS CIVIL LAW

Author(s): Polonovski, Max (Ministry of Culture)

Presentation Format: Oral

Since several decades, in many European countries and in Israel, funerary Jewish archaeology has been blocked in its development by conflicts provoked by lobby groups with religious agenda. One could quote tens of examples of aborted excavations in Europe. It means also a lot of cases of self censored archaeological campaigns. Public authorities, who are often the responsible of the rescue archaeological operations, cannot succeed to impose the general interest which should be their role. The surge of community claims and the influence of fundamentalist groups tend to worsened an already difficult situation and lead to an impossibility to undertake any planned excavation in Jewish medieval cemeteries. One of the characteristics of Judaism is that it does not obey to a hierarchical system, but to a system of interpretation which lead to a competition towards the most rigorous interpretation of the religious law (halakha). Public administration and elected representatives in some cases accept not to apply the civil laws under this pressure. Against well prepared pressure groups who are lobbying at the European Parliament and among Jewish local communities, the scattered scientists are weak since they are not supported by their administration. It leads the archaeologists and historians to search a common strategy to adapt to the new challenges.

247 GATEWAY OR ENDPOINT: SCANDINAVIAN CONTACTS FROM THE THIRD TO FIRST MILLENNIUM BC

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Reiter, Samantha (The National Museum of Denmark) - Wrobel Nørgaard, Heide (Aarhus University) - Suchowska-Ducke, Paulina (Adan Mickiewicz University Poznan)

Format: Regular session

In the recent edition of "Prisoners of Geography: Ten Maps that Tell you Everything You Need to Know about World Politics", Marshall equates geographical position, topography and natural resources of nations with their socio-political destinies. Although Marshall's work is a brilliant reinvestigation of modern history and geopolitics, neither his foundation theory nor the ideas he expresses are new. Emperor Napoleon is quoted as saying that "geography is destiny" and his contemporary Metternich declared "When France sneezes, all of Europe catches cold."

This session demands firstly whether such statements are true and, if so, to what degree they can be applied to the more distant periods of European history. Recent interdisciplinary research has shown that although Scandinavia was along the geographical periphery of Europe, it was nonetheless a transcultural and transformative centre. This session welcomes papers which address the transmission, exchange and transformation of social, economic, material or human contacts between Scandinavia and the greater European Continent. Discussions should revolve around transcultural flows which either originated or terminated in Scandinavia and which address that northern region as a nodal point.

01 THE AU-DELÀ BEYOND THIS TERMINUS: SHAMANISM, STRANGER-KINGS AND PERFORMING, OBTAINING AND CONTROLLING THE FOREIGN IN THE NORDIC BRONZE AGE

Author(s): Reiter, Samantha - Frei, Karin Margarita (National Museum of Denmark)

Presentation Format: Oral

This paper examines the concept of foreignness as a source of power and social negotiation within a Nordic Bronze Age cultural sphere. As such, it situates Scandinavia as both a dynamic cultural hotspot as well as what one might call an "outpost" of Bronze Age civilization as such. The unique geographical position of Scandinavia within easy access of the outlets of Europe's great rivers and increasing waterborne transport possibilities within the last millennia BC enabled Scandinavia to capitalize on its natural resources. Its emergence shifted the cultural map of the Continent.

However much it influences collective politics, this paper firmly stands to separate geography from individual destiny. Like hand-someness, the quality of exoticness is very much tied to its performance, rather than to actual fact. This paper ranges widely, tying together the military strategies of Hannibal and Nero's very public predilection for iced sweets with both Melanesian theories about the structure of human social fabric and the brilliant political strategies which rocketed Mata Hari to fame. In short, it relates understandings of physical distance, travel and power with ancient concepts of social and metaphysical distance, travel and power. It views Scandinavia as an endpoint rather than gateway...but a terminus which had more in kind with a desired final destination than as a forgotten backwater or end-of-line.

02 SHIFTING NETWORKS IN THE EARLY DANISH BRONZE AGE: COMPARING LEAD ISOTOPE DATA OF METAL ARTEFACTS WITH THE ARCHAEOLOGICAL EVIDENCE

Author(s): Noergaard, Heide - Vandkilde, Helle (Aarhus University, Dep. Culture and Society) - Pernicka, Ernst (Curt-Engelhorn-Zentrum für Archäometrie, Mannheim)

Presentation Format: Oral

As early as 2100 BCE, societies in the hotspot zone of Denmark and Scania began to use metal. However, this region did not exploit its own metal ore resources; the origins of the metal used is of key significance to understanding and modelling the cross-European interconnectivities that were established through the trade required for obtaining the necessary raw materials.

For the very first time, the Nordic region was fully dependent on one crucial exogenous resource. The related changes within the political economy surely resulted in the establishment of the Nordic Bronze Age. However, little is known about the significance, extent and the direction of this metal trade. For the Bronze Age in northern Europe (NBA) two possible transport routes can be juxtaposed: a Continental route that connected the Alps with Central Europe and the North and a maritime route linking Mediterranean civilisations with Northwestern European communities along the Atlantic coast. Archaeological evidence of the early periods of the Bronze Age identify contact networks between Northwest and Southeast Europe.

An extensive study of south Scandinavian metal artefacts between 2100-1600 BC used lead and tin-isotope analyses to trace these metal transport routes and trading networks and characterized their significance for the earliest NBA societies in the North. This paper presents these results within a comprehensive approach using the stylistic characteristics of artefact investigation source critically. This is combined with studies of trace elemental compositions and lead isotope data to determine the metals' provenances. As the data consist of around 550 samples evenly distributed over the first 600 years of the period in which the Nordic Bronze Age emerges, this paper presents a realistic reconstruction of actual networks during this crucial period.

03 THE TRANSMISSION AND TRANSFORMATION OF THE SPIRAL ORNAMENTATION

Author(s): Simonsen, Disa (Østfyns Museer)

Presentation Format: Oral

"When physical things travel long distance, knowledge about them tends to become partially contradictory and differentiated. This knowledge, or rather lack of knowledge, creates their value and very often gives them a special symbolic character, used to establish and maintain power in prestige-goods societies" (Pydyn, A. 1999. Exchange and Cultural Interactions.)

The transition from The Neolithic period into Bronze Age in Southern Scandinavia almost seems to have come as a 'complete package' of innovations, ready for the Scandinavians to assimilate into their daily lives. One such innovation is the widely spread ornamentation of the spiral and wavy band. These are solely found on bronze objects belonging to people of high status. For decades the discussion of the origin of the Scandinavian spiral has focused mainly on the Mycenaean Culture with the Carpathian Basin as the sole distributor.

By examining material collected from the Danish islands excluding Bornholm, the Transylvanian area and the two Mycenaean circle graves and study the different types of spirals and wavy band found in these areas in the period 1800-1300 BC, I seek to investigate whether this theory is true. To further narrowing down the routes in which the ornaments travelled, I will also investigate the symbolic meaning of the spiral and wavy band in the three cultural areas, and see whether or not this symbolic meaning changes as the ornaments are transferred to new areas.

04 BRONZE AGE FIRST MOVERS AND THEIR INVISIBLE CONTEMPORARIES

Author(s): Beck, Malene (Østfyns Museer)

Presentation Format: Oral

The excavation of a recently discovered bronze age barrow on the Danish island Funen sheds new light upon economic and social differences, transformation of burial customs and transmission of ideas and materials between the European Continent and Denmark around 1400 B.C. The barrow contained two cremation graves - a man and a woman - which makes them very early examples or first movers, regarding this new burial custom. The cremated bones of the man was buried in a full size oak-coffin with a hilt thonged sword, a fibula partly made of gold, a folding stool and a gold bar. The central graves are, in their own right, spectacular finds with huge perspectives regarding transmission of ideas and materials, but the discovery of a contemporary flat field cemetery, containing at least ten inhumation graves outside the barrow, have made the excavation results even more promising. Men, women and children were buried here in shallow graves. Only a few had regular grave goods and only made of organic materials. Thanks to excellent preservation conditions the anthropological material is unique in a Danish context. This offers the opportunity of investigating social conditions, living standards, family ties, migration etc. in a hitherto invisible group of people in the archaeological record - the 80-90 % of the Bronze Age population that wasn't buried in a barrow. The paper is a preliminary presentation of the excavation results and the research perspectives. At the moment further analyzes are carried out regarding anthropologic issues, 14C dating, chemical analyzes, Sr-isotopes and DNA. The excavation will play a central role in the ongoing discussions and understanding of Bronze Age society in the years to come.

05 SCANDINAVIA'S ROLE IN THE COPPER NETWORKS OF EUROPE IN THE 2ND MILLENNIUM BC: A TRANSDISCIPLINARY APPROACH

Author(s): Melheim, Lene (Museum of Cultural History University of Oslo) - Ling, Johan (Dept. of Historical Studies, University of Gothenburg) - Grandin, Lena - Hjärthner-Holdar, Eva (The Archaeologists, Natural Historical Museums) - Stos-Gale, Zofia (Dept. of Historical Studies, University of Gothenburg)

Presentation Format: Oral

Since 2010, a large Scandinavian collaborative program exploring the provenance of metals has been ongoing, among the most extensive ever launched in Europe using lead isotope and chemical analysis in combination. Nearly four hundred bronzes dated to 2000-500 BCE have been included. While producing some quite surprising results as well as confirming previously established theories about copper sources to Scandinavia, our study has first and foremost contributed to a deeper and more nuanced understanding of the role of the Bronze Age Scandinavians in the trade of metals. Our study shows that metal reached Scandinavia from a variety of ore sources in the British Isles, the Slovak Carpathians, the Austrian Alps, the Italian Alps and other more far-away regions like Iberia, Sardinia and Cyprus. Networks were shifting, apparently, through the 1500 years covered by the project. The noted shifts in ore sources may, to some extent, be correlated with other large-scale processes that affected Bronze Age Europe.

The results, which indicate an active participation by northern traders and sailors, have challenged us to examine phenomena like watercraft technologies, trans-shipment hubs, value denominators, volumes of trade, social complexity in relation to long-distance trade, as well as world systems. This paper will present the main results of the project and discuss Bronze Age trade networks from a Scandinavian perspective.

06 ARCHAOMETALLURGICAL DATA ON LONG DISTANCE NETWORKS BETWEEN CRAFTSPEOPLE OF THE NORDIC BRONZE AGE AND CARPATHIAN BASIN: BELT PLATE FROM DUNAFÖLDVÁR

Author(s): Gyöngyösi, Szilvia (University of Debrecen) - Barkóczy, Péter (FUX Co.; University of Miskolc) - Szabó, Géza (Wosinsky Mór Múzeum) - Wrobel Nørgaard, Heide (Aarhus University, Institute for Culture and Society)

Presentation Format: Oral

Besides the significant regional spreading of objects with varying technological backgrounds, the preservation of basic artisan skills within closed geographical boundaries for centuries indicates a strong adherence to technological traditions. This allows, using technical details and craft traces to define interaction groups of craftspeople, as done for the Bronze Age in Northern Europe, which were part of workshops. As such, workshop specific networks can be defined which indicate, together with the artefact's quality, its position in society. This closed technology, which had formed through centuries of traditions, and the necessary raw materials of consistent quality available throughout Europe, were serving as measures of value. The artefacts produced were often unique within the contemporary European material culture as the large-sized belt disks with wall-thicknesses of a few decimal millimetres. These specialist's products become valuable prestige goods due to the special knowledge required for their production. Single decorative motifs, special tricks of the artisans were kept well-guarded and remained the secrets of the contemporary masters and their patrons.

However, how far can these so specific networks be traced? New studies on a spiral decorated belt plate found in Danube, nearby Dunaföldvár (Hungary) allow first ideas of long-distance networks between distinct workshops in eastern Denmark at around 1500-1300BC. The consistence of the spirals and the characteristic decoration already allowed to compare the said belt plate to the famous Nordic belt plates (1500-1100BC). This new investigation goes even further. Detailed imaging, metallographic investigation, trace element and lead isotope analysis will allow to securely relate this belt plate to its closest relatives 1500km far away.

07 WARRIORS OF EUROPE. AN OVERVIEW FROM SARDINIAN TO SCANDINAVIAN BRONZE AGE IMAGES OF A WARRIOR ÉLITE

Author(s): Matta, Valentina (Aarhus University)

Presentation Format: Oral

The idea of Bronze Age Europe as a “continent of linked communities” as Richard J. Harrison wrote, has been most recently substantiated through the studies of metal trade and metal provenance. The Mediterranean Nuragic civilisation was clearly linked with European networks especially regarding the metal trade. These contacts seemed to have focussed on West and Northern Europe and are evidenced by a range of artefact types, prominently demonstrated by the horned warriors flanged hilted swords and round-shields, in some cases commemorated as semi-divine ancestor heroes. These representations include the production of the Nuragic Bronze statuettes. Warriors reflect a new way of living within Bronze Age society. As has been hypothesised, this change (around 1200 BCE) seems related to the establishment of a new social class in Sardinia and the rest of Europe. Moreover, the idea of a shared ideology and a common behaviour between different Bronze Age cultures occurs within common archaeological contexts in select areas.

The aim of this paper is to give an overview of these warrior representations in three main areas: Sardinia, the Iberian Peninsula and Scandinavia. A detailed examination of common elements, finding contexts, chronology and metal provenance will allow this paper to give a wide perspective on how this image might have spread throughout West and Northern Europe, and if it can truly be considered to have retained the same value within each of these various cultures in terms of archaeological context.

08 SCANDINAVIA AS BENEFICIARY OF EUROPE'S LATE BRONZE AGE “GLOBALIZATION”

Author(s): Suchowska-Ducke, Paulina (Adam Mickiewicz University in Poznan, Institute of Archaeology)

Presentation Format: Oral

Cross-cultural communication between the societies of Scandinavia and their contemporaries, near and far, are well-documented by various sources. This is true for both prehistoric and historic times. Nevertheless, the range and intensity of these contacts can be quite surprising. This is certainly the case for the Bronze Age relations between Scandinavia and the Mediterranean Basin. Archaeological evidence for the latter is diverse. The published material (both artefacts and raw materials) has socio-political (emergence of new social organizations and institutions), ritual (religion and beliefs), artistic (rock art) and technological (innovations and knowledge) dimensions. In addition to its diversity, the archaeological record of Bronze Age Scandinavia is exceptionally rich, including spectacular metal finds and well-preserved burial contexts. This paper examines the various long-distance relations between Scandinavian and Mediterranean societies that developed during the second millennium BC. It will address the question of what exactly made Scandinavia such an important region in the Bronze Age. Archaeological evidence will be presented in support of the hypothesis that Late Bronze Age Scandinavia's long-distance links with the south were a key factor in its development, making it both gateway and endpoint for the exchange, transformation and transmissions of objects and ideas. In this regard, Scandinavian Bronze Age societies can be considered early beneficiaries of intensified cross-cultural links and exchange in Europe, a process that is referred to as „globalization“ in our times.

248 CONTROLS AND UNCERTAINTIES IN CREATING SR ISOTOPE BIOSPHERE MAPS FOR MIGRATION STUDIES

Theme: Theories and methods in archaeological sciences

Organisers: Evans, Jane (British Geological Survey) - Frei, Karin (National Museum of Denmark)

Format: Regular session

The use of isotope composition, especially Sr isotopes, has radically changed the way in which people study and interpret human mobility in the past. The method has provided insights into human movement that were not previously possible, highlighting such areas as childhood movement and the degree of migration in some prehistoric periods.

The Sr isotope method depends upon linking the composition of human tissues, such as tooth enamel, to geographic areas through the composition of ingested locally produced food. This is linked, through soil composition, to the strontium sources which are usually the underlying rocks.

The application of this method, to faunal migration problems, is outstripping the ability of scientists to provide robust reference datasets against which the faunal tissues can be tested. This session examines the current state of biosphere mapping, considered the merits of various analogues, and the statistical and mapping methods used. The aim of the session is to produce a focussed approach to mapping that will underpin migration studies over the next years to come.

01 ISOTOPE MIGRATION THROUGH SPACE, TIME, AND BODY TISSUES: WHERE IS THE LOCAL SIGNATURE IN A GLOBALISED WORLD?

Author(s): Vohberger, Marina - Anders, Dominic - Osmanovic, Amira - Kretzinger, Julia (LMU Munich)

Presentation Format: Oral

The analysis of stable isotopes in bioarchaeology was established as an important tool over the past decades. It is also used in several other scientific disciplines such as ecology and forensics. In general, stable isotope ratios serve as natural markers for different transport processes of matter through the geosphere, hydrosphere and biosphere. In physical anthropology, stable isotope ratios can be used to detect possible migrations or trading of ancient populations or individuals, for the reconstruction of dietary habits, palaeobiodiversity and climatic conditions. However various species specific physiological and metabolic peculiarities are surprisingly unknown and hence not taken into account during application of this methodology. One such specific concern is the source partitioning of stable isotopic ratios into the different consumers' tissues such as bone, teeth, fur, bristles, blood, and meat. Therefore, the SPOCK-project (Source partitioning of stable isotopes in the body tissues of livestock) aims to fill this knowledge gap by investigating the distribution and flow of stable isotopes into and within the organism of domestic livestock by conducting several controlled feeding studies on different species. In the first phase the focus is on the analysis of stable strontium and oxygen isotopes in pigs and chicken which are commonly used for reconstructing migratory events. First results show that there is a relation between water source, food and body tissue but no influence by underlying soil. These results are being applied to already known archaeological sites with isotopic data to refine mobility and locality patterns.

This research project/publication was funded by LMU Munich's Institutional Strategy LMUexcellent within the framework of the German Excellence Initiative.

02 CONTRIBUTION OF STRONTIUM TO THE HUMAN DIET FROM QUERNS AND MILLSTONES: AN EXPERIMENT IN DIGESTIVE SR-ISOTOPE UPTAKE

Author(s): Johnson, Lucie - Montgomery, Janet (Durham University) - Evans, Jane (NIGL, British Geological Survey) - Hamilton, Elliott (British Geological Survey)

Presentation Format: Oral

The question of whether rock grit ingested unintentionally from querns or millstones or deliberately through pica or geophagy is bioaccessible in the human gut has not been addressed in archaeological Sr-isotope studies. In this paper we employed the Unified Bioaccessibility Method (UBM: Hamilton et al., 2015) to assess whether Sr-isotopes in three known British quern and millstone rock types can be bioaccessible by the human gut, including: Millstone Grit from the Peak District (central England); Pennant Sandstone from the Forest of Dean (Gloucestershire); Eskdale Granite from the Lake District (Cumbria). The abrasive gritstones and sandstones are well established rocks for milling (Peacock, 2013, p.62-65; Watts, 2014, p.29-30) while the granite was included as it is one of the most radiogenic rocks found within Britain to be used as a grinding stone and thus represents a potentially very high $^{87}\text{Sr}/^{86}\text{Sr}$ bioaccessible value. It was determined that ingested rock grit can provide bioaccessible $^{87}\text{Sr}/^{86}\text{Sr}$, but that unintentional consumption is unlikely to equate to more than 1% of the diet (by mass) and will not significantly change, i.e. by > 0.001 , the $^{87}\text{Sr}/^{86}\text{Sr}$ within human skeletal tissue. In conclusion, the use of querns or millstones will not affect the interpretation of archaeological human $^{87}\text{Sr}/^{86}\text{Sr}$ values in Britain.

03 SEARCHING FOR PAST SR BASELINE VALUES IN MODERN ENVIRONMENTS: CASES FROM POLAND

Author(s): Pospieszny, Lukasz (Institute of Archaeology and Ethnology, Polish Academy of Sciences) - Makarowicz, Przemyslaw (Institute of Archaeology, Adam Mickiewicz University in Poznan) - Belka, Zdzislaw (Isotope Laboratory, Adam Mickiewicz University in Poznan) - Szczepanek, Anita (Institute of Archaeology and Ethnology, Polish Academy of Sciences; Jagiellonian University Medical College) - Górski, Jacek (Archaeological Museum of Krakow) - Taras, Halina (Institute of Archaeology, Maria Curie-Skłodowska University)

Presentation Format: Oral

In recent years one can observe a shift from looking for past immigrants by measuring Sr isotope ratios for few archaeological samples to more comprehensive studies exploring the Sr mixing in natural environments. However, reconstructing human mobility usually means comparing values of, on one hand, modern plants, sediments and water, and ancient teeth and bones on the other. This can in consequence lead to erroneous estimations and interpretations, and today a more advanced approach is highly requested. We will discuss cases where past Sr isotope local ranges were retrieved basing on combinations of different proxies. First, the limitations of basing on water signatures, strongly changed by modern contaminants, will be exposed as this problem affects the drainage systems of largest rivers in Central Europe like the Oder. Second, the importance of direct analyses of local geological substrate will be illustrated by examples from both lowlands, built of postglacial tilts and sands, and highlands with more complex sedimentary cover, composed of rocks of various age and origins, for instance the loess. We will focus on areas heavily influenced by modern open-pit mines and industry. Finally, we shall explore the potential of large data sets received for past humans as an evidence of local variation in Sr isotope composition and people's mobility. The advantages and disadvantages of combining different isotopic systems will be discussed as well.

04 CREATING A SR ISOSCAPE - FROM PLANNING TO MAPPING

Author(s): Snoeck, Christophe (Vrije Universiteit Brussel) - Pouncett, John (University of Oxford) - Claeys, Philippe (Vrije Universiteit Brussel) - Fernández-Crespo, Teresa (University of Oxford) - Lee-Thorp, Julia (University of Oxford) - Pellegrini, Maura (University of Oxford) - Ostapkowicz, Joanna (University of Oxford) - Triantaphyllou, Sevi (Aristotle University of Thessaloniki) - Ryan, Saskia (Harvard University) - Schulting, Rick (University of Oxford) - Mattielli, Nadine (Université Libre de Bruxelles) - Tys, Dries - Spros, Rachèl (Vrije Universiteit Brussel)

Presentation Format: Oral

Strontium isotopes ($^{87}\text{Sr}/^{86}\text{Sr}$) are often measured in archaeological remains (e.g. tooth enamel and cremated bone) to gather information about mobility and migrations of past animal and human populations. However, without a reference baseline (often referred to as the biologically available strontium isotope map), it can be difficult to interpret the strontium isotope results.

Recently, an increasing number of studies have created 'Sr isoscapes' to address the issue (e.g. Great Britain, France, the Netherlands), using different types of samples such as water, soil, snails, plants (grasses, shrubs and trees) and/or animal tooth fragments. Each of these sample types has advantages and drawbacks, so it is important to select carefully depending on the region and sample availability.

Here we discuss the different steps needed to create a strontium isoscape from the sampling to the strontium isotope analysis and mapping stages. Methodological challenges will be discussed. Results from Ireland, Northern Spain, Belgium, Crete, Trinidad, and Florida (US) will be presented to highlight the potential and limitations of creating Sr isoscapes in different environments (e.g. islands, river plains, salt and pitch lakes).

05 CREATING A CONCENTRATION-WEIGHTED MIXING MODEL FOR THE CALCULATION OF THE $^{87}\text{Sr}/^{86}\text{Sr}$ RANGE OF LOCAL VERTEBRATES USING MODERN ENVIRONMENTAL MATERIAL

Author(s): Lengfelder, Fabiola - Söllner, Frank - Grupe, Gisela (Ludwig-Maximilians-University Munich)

Presentation Format: Oral

Stable strontium isotope analyses offer the opportunity of detecting the region of origin of people and animals and to reconstruct possible migration patterns as long as a spatially structured variation of the isotopic signature is given. Potential factors for this variation can be found in the geological and ecological nature.

Unfortunately, the isotopic values of local bedrock, soil, water, flora, fauna and people frequently do not match. This discrepancy is due to the varying degree of elemental bio-availability, which is a function of the strength of chemical bonds, and the fact that consumer isotopic signatures are a mixture of the concentration-weighted average of strontium sources. It is therefore requisite to determine the bio-available isotopic signature of the corresponding localities in question.

A concentration-weighted mixing model for the calculation of the $^{87}\text{Sr}/^{86}\text{Sr}$ isotopic range of local animals and humans is established. The most important strontium sources were reduced to the origin of elemental strontium: groundwater, soil, flora and precipitation. The $^{87}\text{Sr}/^{86}\text{Sr}$ isotopic ratios and strontium concentrations of local groundwater, soil and wood with deep reaching roots were measured for 47 locations within an alpine transect of the European Alps, namely the Inn-Eisack-Etsch passage. Precipitation data were excerpted from literature. $^{87}\text{Sr}/^{86}\text{Sr}$ values of locally recovered archaeozoological and anthropological remains were compared with the thus calculated local $^{87}\text{Sr}/^{86}\text{Sr}$ range.

The concept and the assumptions of the mixing model are introduced and the potential of the model for a prediction of the $^{87}\text{Sr}/^{86}\text{Sr}$ range of local vertebrates is demonstrated.

06 CONSTRUCTING STRONTIUM ISOSCAPES IN CYPRUS USING SOIL, WATER AND PLANT SAMPLES

Author(s): Ladegaard-Pedersen, Pernille - Frei, Karin (National Museum of Denmark) - Kristiansen, Kristian (University of Gothenburg)

Presentation Format: Oral

This talk will be on the intra- and inter-site variability of bioavailable Sr isotopic ratios in soil (exchangeable fraction), water and plants in a geologically complex region (Cyprus).

Cyprus was a nodal point of travel and trade in the Bronze Age, and thus a nodal point in prehistory in relation to mobility and provenance studies, however, to this day no complete reference maps of the bioavailable strontium isotopes of the island have been produced. As part of the "Towards a New European Prehistory" research project we are now constructing isoscapes of the bioavailable strontium isotopic ratios across Cyprus. We have used environmental proxies to this end, sampling soil, plants and water from the many terranes of the island as well as in three sites of specific, archaeological interest (Amathus, Idalion and Hala Sultan Tekke). This paper explores the intra- and inter-site variation between the environmental proxies as well as site-specific relationships (or lack thereof) between soil (exchangeable fraction); water (groundwater and surface water); and plants. From this, we discuss the construction of isoscapes from environmental proxies for archaeological provenance studies. A comparable study from the Danish island of Bornholm allows us to juxtapose distinctions between isoscapes of different regions and climate zones.

07 SR ISOSCAPES IN THE NETHERLANDS – THE CHALLENGES OF MAPPING A DYNAMIC ENVIRONMENT

Author(s): Kootker, Lisette - Davies, Gareth R. (Vrije Universiteit Amsterdam)

Presentation Format: Oral

Strontium isotope analysis has been successfully applied to reconstruct past mobility patterns for more than three decades. Although the underlying principle may appear to be straightforward, the interpretation of the obtained human or faunal isotope data is complicated, and requires a vast amount of baseline data. Hence, a thorough understanding of the patterns of spatial environmental isotopic variations is of key importance to obtain a full understanding of variations in archaeological samples for migration studies. Following approaches applied to other parts of Europe, a preliminary archaeological bioavailable strontium map of the Netherlands was published in 2016. The diversity of the Dutch geological subsurface is directly reflected in the spatial distribution of $87\text{Sr}/86\text{Sr}$ ratios, and six isoscapes or isotope packages could be defined with $87\text{Sr}/86\text{Sr}$ ranging from 0.7074 to 0.7113. Five distinct geological environments yielded no archaeological data, mainly due to poor preservation in acidic soils. This paper covers the sampling and analytical methodology behind of the current archaeological strontium isotope map. In addition, results of an applicability assessment of the map for reconstructing past mobility patterns will be presented. Moreover, preliminary data will be presented of modern biosphere samples. Although the use of present day biosphere data might enable filling in the data gaps in the current Dutch Sr isotope map, this approach requires validation of the extent to which specific floral are offset compared to the average archaeological bioavailable strontium.

08 DEVELOPING AND DESIGNING A WEB-BASED, MULTI-ISOTOPE BIOSPHERE MAP FOR BRITAIN.

Author(s): Evans, Jane (British Geological Survey; Nottingham University; Leicester University) - Chenery, Carolyn - Mee, Katy - Cartwright, Clive - Marchant, Andrew - Lee, Katy (British Geological Survey)

Presentation Format: Oral

The application of isotopes, as a method for looking at geographic origin in archaeological studies, is well established and there are an increasing number of studies for both human childhood origins and animal studies. The current published maps of strontium isotope biosphere variations (Evans et al 2010) and oxygen isotope variation in drinking water (Darling et al 2002) have been the main data sets against which the tooth enamel unknowns are tested and compared in British studies. However, as the archaeological problems become more sophisticated these maps require updating and need increased resolution. There is also an interest in sulfur as a migration and dietary tool. These considerations have prompted us to create a web-based resource designed to be updated as new data and new layers of information become available. The Sr isotope layer has been improved with new data, the oxygen is presented both as drinking water zones (a layer has been added for direct measurements of oxygen on tooth enamel) and a plant sulfur isotope composition layer has been created. The hope is that this resource can be developed through time to keep pace with the developments in interpretation.

Darling, W. C., A. H. Bath and J. C. Talbot (2003). "The O & H stable isotopic composition of fresh waters in the British Isles: 2, Surface waters and groundwater." *Hydrology and Earth System Sciences* 7(2): 183-195.

Evans, J. A., J. Montgomery, G. Wildman and N. Boulton (2010). "Spatial variations in biosphere Sr-87/Sr-86 in Britain." *Journal of the Geological Society* 167(1): 1-4.

09 COMPARISON OF SR ISOTOPE RATIOS IN A LARGE SET OF ENVIRONMENTAL SAMPLES FROM VARIOUS LOCATIONS IN CENTRAL EUROPE

Author(s): Maurer, Anne-France (HERCULES Laboratory, Evora) - Knipper, Corina (Curt Engelhorn Zentrum, Mannheim) - Winger, Daniel (Heinrich Schliemann-Institut für Altertumswissenschaften, Rostock) - Galer, Stephen JG (Max Planck Institute for Chemistry, Mainz) - Rosner, Martin (IsoAnalysis UG, Berlin) - von Freeden, Uta (German Archaeological Institute, Roman Germanic Commission, Frankfurt a. M.) - Alt, Kurt W (IPNA - Integrative Prähistorische und Naturwissenschaftliche Archäologie, Basel) - Tütken, Thomas - Schöne, Bernd R (Institute of Geosciences, University of Mainz)

Presentation Format: Oral

In 2009-2011, the German Ministry of Education and Research (BMBF) supported the transdisciplinary so called "Lombard Project" which aimed at examining the mobility and migration patterns of Lombard period populations from the Lower Elbe to Italy during the early medieval epoch (5th-6th century A.D.).

Strontium isotope analysis was one of the main tools applied in this study. In order to discriminate non-local from local individuals at the sampled cemeteries, we explored which environmental samples would be most representative of the isotopic composition of biologically available strontium. Therefore, we analyzed strontium isotopic compositions of many biological and geological samples, including river waters, modern vegetation, snail shells as well as archaeological animal teeth. The samples represent a variety of geological units in the near vicinity of eight cemeteries dating from the 6th century in Germany, the Czech Republic, Austria and Hungary, and along a transect that covers the area between them.

The method was first tested in central Germany (Maurer et al 2012). Here we present the complete dataset collected, consisting of more than six hundred Sr isotope analyses acquired during the Lombard Project. We discuss discrepancies observed between the different kinds of samples with the aim of providing further insight into current discussion on generating Sr isotope reference maps for future studies.

Maurer A-F, Galer SJG, Knipper C, Beierlein L, Nunn EV, Peters D, Tütken T, Alt KW, Schöne BR (2012) Bioavailable $^{87}\text{Sr}/^{86}\text{Sr}$ in different environmental samples – Effects of anthropogenic contamination and implications for isoscapes in past migration studies. *Science of the Total Environment*, 433, 216-229.

10 STRONTIUM ISOTOPES, ANIMAL HUSBANDRY AND URBAN-HINTERLAND RELATIONSHIPS: A VIEW FROM SOUTH WEST ENGLAND

Author(s): Frémondeau, Delphine (University of Reading) - Evans, Jane (British Geological Survey, Keyworth) - Müldner, Gundula (Department of Archaeology, University of Reading)

Presentation Format: Oral

The application of isotope biogeochemistry in zooarchaeology has evolved considerably over recent years, addressing ever more complex and ambitious research questions. This presentation will give an overview of the methodological challenges and considerations involved in the Exeter: A Place in Time project, which undertakes to investigate meat supply to the city of Exeter, from the Roman to the late medieval period (1st to 16th century AD) by isotope analysis of sheep and cattle skeletal remains. While Exeter's location at the juncture of two geological provinces (the Palaeozoic terrains of South West England, including the granitic uplands of Dartmoor, to the west and the largely Mesozoic lowlands to the east), makes it more suitable for such an investigation than most other historic towns and the strontium biosphere of Britain is relatively well-mapped compared to other European regions, interpretation of the data nevertheless requires careful consideration of the methodological complexities. We will compare the results from archaeological fauna with strontium isotope data from modern plants as well as livestock with known life histories and discuss the merits and limitations of each approach with regards to different research questions.

This research is supported by the UK Arts and Humanities Research Council (Reference AH/N001931/1).

11 PRODUCING A DETAILED LOCAL SCALE SR ISOTOPE BIOSPHERE MAP WITH DIRECT APPLICATION TO PROVENANCE EARLY MEDIEVAL POPULATIONS.

Author(s): Ryan, Saskia (Harvard University) - Crowley, Quentin (Trinity College Dublin) - Reynard, Linda (Harvard University) - Snoeck, Christophe (Vrije Universiteit Brussel) - Tuross, Noreen (Harvard University)

Presentation Format: Oral

Strontium isotope ($^{87}\text{Sr}/^{86}\text{Sr}$) analyses of the leachable fraction of soil, plants and surface waters from a small (approx. 2,000 km²), archaeologically significant area in Co. Meath, Ireland are applied as a proxy to assess Sr bioavailability and transfer within the biosphere. These isotope data geochemically constrain the high degree of spatial variability in $^{87}\text{Sr}/^{86}\text{Sr}$ in this region and highlight the inherent requirement for high-density sampling to effectively isotopically characterize a region with distinct Sr reservoirs. Of the different sample media analyzed, it was noted that careful selection of appropriate soil leaching protocols is necessary for an informative estimate of the natural ranges that exist within the pedosphere, deeming plant material to be a more representative sample medium for mapping bioavailable Sr.

Sufficient geographic variability is one of the factors that underpins the use of $^{87}\text{Sr}/^{86}\text{Sr}$ for archaeological provenance. The baseline biosphere $^{87}\text{Sr}/^{86}\text{Sr}$ dataset produced here is applied to an archaeological case study of three early medieval populations and allows the successful identification of two individuals, buried on top of one another, who were unlikely to have lived at the site associated with their place of burial. This case study demonstrates the advantage of having a detailed baseline dataset for comparison with archaeological remains.

12 THE CONTRIBUTION OF INFANT TEETH TO THE DEFINITION OF STRONTIUM ISOTOPE BASELINES

Author(s): Knipper, Corina (Curt-Engelhorn Center for Archaeometry gGmbH, Mannheim)

Presentation Format: Oral

Characterizing the isotope ratios of the biologically available strontium is a prerequisite for the identification of non-local individuals in archaeological contexts. A significant advantage of modern vegetation and water samples is the possibility to relate their isotope ratios to specific geological substrates. This allows establishing isotope baselines which include all spatially relevant geological units around an archaeological site. Consequently, such ranges can be very wide if the geological conditions are highly variable. They may include isotope ratios that are typical for geological units which did not contribute to the human food web in any significant way, even though they were present in the near vicinity of a site. Therefore, it is highly valuable to explore any targeted selection of the land that was used for food production by the studied communities. Under the premise that in sedentary communities the likelihood of individual residential changes increases with age, this presentation explores the value of infant teeth to the specification of local strontium isotope baselines. Sampling of large burial communities has repeatedly returned more homogeneous isotope ratios in infant teeth than seen among adults and comparative samples unrelated to the human burials. Using examples from the European Bronze Age, Iron Age and Migration Period, the contribution demonstrates differences among the data ranges of adult individuals and children. It explores the significance of the latter to identify isotope ranges that represent agricultural land within much wider total ranges of bio-available strontium and therefore contribute to the identification of non-local individuals among burial communities.

13 FINDING A EUROPEAN HOME FOR HUMANS WITH 87SR/86SR RATIOS ABOVE 0.715 - IS THE BALTIC SHIELD THE ONLY OPTION?

Author(s): Montgomery, Janet - Johnson, Lucie (Durham Universit) - Evans, Jane (NIGL, British Geological Survey)

Presentation Format: Oral

Since Price et al.'s (1994) seminal strontium isotope study of Bell Beaker burials of northern Europe, archaeological humans with enamel $87\text{Sr}/86\text{Sr}$ above 0.715 are seldom found, and when they are, they rarely number more than one or two skeletons at any given site. Such high ratios are usually attributed to geographic origins in granitic or gneissic, usually upland, terrains or the ancient Baltic Shield. Crucially, the Baltic Shield is one of the few places where such high-Sr people are buried in their place of origin because bone rarely survives in temperate, maritime granitic terrains due to the high acidity of the resulting soils. As a consequence, in Britain, such high-Sr people have only been found when they have migrated from their place of origin and been buried in a location from which they do not originate. In Britain, we currently have no in situ high-Sr human or animal populations to which we can ascribe origins for people with $87\text{Sr}/86\text{Sr}$ above 0.715 and very few examples of regions that routinely and reliably return biosphere $87\text{Sr}/86\text{Sr}$ values above 0.715. In this paper we review the issues and evidence for high-Sr biospheres and in Britain and assess the likelihood that a secure home for high-Sr humans will be found in the British Isles or the wider region of northern Europe south of the Baltic Shield.

254 MOBILITY AND CULTURE CHANGE DURING TRANSITIONAL PERIODS IN AND AROUND THE ALPINE REGION

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Maxwell, Ashley (University of South Florida) - Hughes, Ryan (Independent Scholar) - Tykot, Robert (University of South Florida) - Vianello, Andrea (University of South Florida)

Format: Regular session

Transitional periods, often accompanying the migrations of people and/or cultures to an area, are times of significant socio-cultural change as evidenced in the archaeological record. These periods are particularly important to study, as they can provide context and understanding to the resulting assimilation, colonization, and ethnogenesis of populations. We aim to discuss how the migration of people during key transitional periods in the history of the Alpine region altered the social, economic, and political landscapes as evidenced by human and animal remains as well as material culture. We are interested in papers dealing with various transitional periods, for example, from the Mesolithic to Neolithic, Copper Age to Bronze Age, Bronze Age to Iron Age, Pre-Roman to Roman Period, and Late Roman to Early Medieval Period. Although there are multiple methodological approaches to answering questions related to migration and socio-economic change, this session will focus on the use of archaeological science, including biochemical analyses of human and faunal remains, i.e. stable isotopes, ancient DNA analysis, and provenience studies on material remains to discuss these transitional periods in the archaeological record.

We invite scholars to present papers with a geographic focus in and around the Alpine region, including Italy, France, Switzerland, Germany, Austria, Slovenia, and Monaco who are studying (1) the impact of migration on social, economic, or political environments during key transitional periods, and (2) employing archaeological science methodologies.

ABSTRACTS

01 ASSESSING THE ROMAN IMPACT ON AGRICULTURE IN THE SWISS PLATEAU (480 B.C.E. - 476 C.E.)

Author(s): Hughes, Ryan (Independent Scholar)

Presentation Format: Oral

While the political, social and economic impact of Roman control of the Swiss plateau is undeniable and readily attested by the impressive traces scattered across the landscape, the agricultural impact is less evident. Recent advances in scientific archaeology, particularly the increase in funding opportunities, has seen an explosion in the quality and quantity of botanical, zoological and palynological data for the fertile and densely populated Swiss Plateau. The analysis of these sources of data complicates the common image of pervasive Roman influence in all elements of life for the Iron Age populations. While the Romans introduced a variety of new plant and tree crops, the impact of these crops appears less than was previously thought and most prominent at urban sites, particularly those with an attested Roman population, while Iron Age practices and preferences continued alongside, and persisted after the decline of Roman influence in the area. The same trends can be seen in animal remains recovered from the region, with Roman influence being strongest at larger urban entities and lesser in the countryside. This paper explores the agricultural impact of Roman control on the Swiss Plateau through changes in the palynological, botanical and zoological remains from the La Tène period (480 - late 1st century B.C.E.) through to the late 5th century C.E.

02 IRON AGE MIGRANTS? DIET, MOBILITY, AND FUNERARY TREATMENT IN THE PRE-ROMAN POPULATION OF VERONA (NORTHERN ITALY – 3RD-1ST C. BC)

Author(s): Laffranchi, Zita (Department of Legal Medicine, Toxicology and Physical Anthropology, Faculty of Medicine, University of Granada) - Milella, Marco (Department of Anthropology, University of Zurich)

Presentation Format: Oral

Little is known about the population dynamics characterizing pre-Roman Northern Italy. Accordingly, the frequency and type of mobility taking place in this region and time, and their social correlates (e.g. social incorporation and exclusion) are largely unexplored. In the Cisalpine region this is especially true for the area of Verona. Here, we explore the use of variability in diet as a proxy of mobility at Seminario Vescovile (SV: Verona, 3rd-1st c. BC), a necropolis pertaining to the pre-Roman (Cenomani Gauls) occupation of this area. $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ values are obtained from rib collagen of 54 individuals (>21 years) of both sexes. We then compare isotopic data with the results of a multivariate study of funerary features (e.g. position of the grave, orientation of the skeleton, presence of grave goods). $\delta^{13}\text{C}$ data are consistent with a population characterized by a diet mostly based on C4 plants. On the other hand, a subset of individuals (n=6) share isotopic values pointing to habitual consumption of C3 plants, a possible byproduct of alloctonous origin. Interestingly, while this subsample appears strongly biased demographically – 5/6 of individuals are males – patterns of $\delta^{15}\text{N}$ and funerary variables fits the variability observed at SV, which suggests a scenario of mobility not associated to social differentiation.

Overall our data demonstrate the usefulness of alternative approaches to the study of past mobility, and the benefit of a multidisciplinary strategy in biocultural investigations.

03 MOBILITY IN EARLY MEDIEVAL NORTHEASTERN ITALY: A VIEW FROM STRONTIUM AND OXYGEN ISOTOPE ANALYSES

Author(s): Vianello, Andrea - Tykot, Robert (University of South Florida)

Presentation Format: Oral

A series of strontium and oxygen isotope analyses has been carried out on Late Roman and Byzantine individuals buried in southern Veneto and Emilia-Romagna in northeastern Italy to investigate the mobility of these ancient people at a time of great changes and migratory movements. Over 100 samples were selected to represent the Late Antique society between 5th and 8th century AD in the area just north of Ravenna, then capital of the Byzantine Empire in Italy, a contested area that saw many armies crossing it. The research reveals social mobility in Veneto and Emilia-Romagna, the effective impact of Late Antiquity migrations across the region and provide the strongest clue yet on who may have founded Venice and who lived in the Byzantine Empire of Ravenna.

The isotopic study includes both bone apatite and enamel from several teeth, providing a unique opportunity to determine whether an individual was born outside the region of interest, moved into it after birth, or just died in the area. Two key questions of the research have been answered: identifying the Byzantine (native, post-Roman) people in the region, and determining the degree of mobility in the area in those centuries. The results will be discussed and compared with the known movements in the region from literary sources.

04 AN INVESTIGATION OF SOCIOPOLITICAL AND ECONOMIC CHANGES IN EARLY MEDIEVAL VENETO AFTER THE ARRIVAL OF THE LANGOBARDS

Author(s): Maxwell, Ashley - Tykot, Robert - Vianello, Andrea (University of South Florida)

Presentation Format: Oral

After the fall of the Western Roman Empire, and the centuries that led up to the Early Medieval Period, northern Italy experienced multiple invasions from various barbaric tribal groups, including the Langobards. The Langobards, a Germanic cultural group that moved into Italy after the collapse of the Roman Empire, reached the Veneto region around AD 568 through the Alps from Pannonia. This migratory movement triggered multiple conflicts with the existing populations, dividing the landscape, and pushing the native post-Roman and Byzantine populations towards the Venetian Lagoon. The impact that the Langobards had in changing economic and political structures in this area is poorly understood, with scholars divided between narratives that suggest the Langobards had a direct influence, while others believe they assimilated into the existing structure. Archaeological excavations of archaeobotanical remains from sites in northern Italy show evidence of an increase in low-grade cereal production of millet during the Early Medieval Period, suggesting a period of economic stress during the Langobard arrival.

This paper presents results from an on-going investigation into identifying non-local Langobards in multiple cemetery populations in northeastern Italy during the late 6th to early 7th century AD using oxygen and strontium stable isotope analysis. In addition, a dietary analysis using carbon and nitrogen was also performed to interpret the political economy during this transitional period. The results indicate the presence of non-local individuals in the cemetery populations, and a definite contribution of millet in the diet of individuals buried in the Veneto during the Early Medieval Period, confirming the archaeobotanical record.

TRANSFORMING PEATLANDS. CHANGE AND CONTINUITY REFLECTED THROUGH PREHISTORIC AND HISTORIC SITES IN FENS AND BOGS

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Groß, Daniel (Centre for Baltic and Scandinavian Archaeology - ZBSA) - van Beek, Roy (Wageningen University & Research) - Gearey, Benjamin (Department of Archaeology, University College Cork)

Format: Regular session

Peatlands are extra-ordinary archives for understanding prehistoric and historic landscape change and cultural processes. As a characterizing element of many lowland areas in Northern and Central Europe they have long been embedded in socio-cultural life and have undergone a range of natural and anthropogenic transformations. On the one hand, climate change, agriculture and urbanization continues to have a severe impact on many peatlands, some of these processes enable the discovery of and subsequent research into peatland archaeological sites and processes.

In this session we want to address different aspects related to the value of peatlands as cultural and ecological archives as well as the extended insight they provide into prehistoric and early historic life. New discoveries and studies are welcomed that provide insight into (pre) historic landscape, life, and lifeways such as overarching projects that embed archaeological sites within their cultural and ecological context. Threats to peatland related cultural remains (e.g. peat extraction, agriculture and infrastructural developments) and potentials, methods, and possibilities of protecting them shall be addressed. We similarly welcome contributions dealing with topics like integrating public or political actors within archaeological research into peatland sites.

We hope to foster discussions about European perspectives on peatland archaeology and further development of research methods, approaches and standards. The session might serve as a 'stepping stone' towards a European agenda for understanding the past and preserving into the future these valuable but fragile landscapes.

ABSTRACTS

01 RECONSTRUCTING THE WORLD OF YDE GIRL: THE MOST ICONIC DUTCH BOG BODY IN CONTEXT

Author(s): Beek, Roy - Quik, Cindy - Candel, Jasper (Wageningen University & Research)

Presentation Format: Oral

Archaeological finds from bogs have always attracted a lot of attention, because they often represent spectacular, rare and well preserved relics that can not be retrieved from other landscape types. Remarkably, the original physical geographical, social and ideological context of such finds are heavily underexposed. This research deficit is typical for peat finds from large parts of North-west Europe. Part of the explanation probably lies in the early discovery of most of these finds, generally related to peat exploitation, combined with a lack of formal academic research programs. More fundamental reasons may have to be looked for in two deeply rooted dichotomies: the first between (the perception and research history of) wetlands and drylands, and the second between social and environmental sciences in general. In this paper we argue that – in order to really unravel the meaning of these peat finds – it is essential to break down these barriers and create interdisciplinary reconstructions of the holistic cultural and social landscape at the time of deposition. We try to reach this aim by contextualising the most iconic Dutch bog body: 15-16 year old Yde Girl. She was deposited in a swampy depression, about 2000 years ago. We reconstruct her world by an interdisciplinary approach combining archaeological, geological, palynological and historical sources.

02 TRANSFORMING WETLANDS: FLOODPLAIN-MIRE INTERACTIONS AND HUMAN IMPACTS WITHIN A CONNECTED WETLAND LANDSCAPE

Author(s): Whitehouse, Nicki (School of Geography, Earth and Environment) - Mansell, Lauren (Palaeoecology, School of Natural and Built Environment, Queen's University Belfast) - Gearey, Ben (Dept of Archaeology, University College Cork) - Roe, Helen (Geography, School of Natural and Built Environment, Queen's University Belfast) - Chapman, Henry (Classics, Ancient History and Archaeology, University of Birmingham)

Presentation Format: Oral

We examine connections between adjacent wetland landscape ecosystems and consider how archaeological activities and palaeoenvironmental records reflect human impacts. Our focus is the Humberhead Levels (North Lincolnshire and South Yorkshire, UK), where there has been a long history of palaeoenvironmental and archaeological study. The raised mires of Thorne and Hatfield Moors dominate the landscape but these are closely associated with the floodplains of the rivers Torne, Idle, Don and Went. Using extensive chronological Bayesian modelling, the diverse and complex character of wetland development and human-environment interactions within the floodplains and mires is outlined.

The focus of much archaeological activity is within floodplain areas, where human impacts start at 4200-3800 cal BC. Extensive raised mire peat and floodplain deposits from 3300 cal BC signify a wetter landscape, but areas of raised mire continue to remain important, as evidenced by the Neolithic pine corduroy trackway on Hatfield Moors (2800-2500 cal BC) and a Bronze age trackway on Thorne Moors (1860-1300 cal BC). Woodland decline accelerates during the early Bronze age (c. 2300 cal BC) in the River Torne,

Idle, Hampole Beck floodplains. Alluviation occurs within the River Torne catchment, climatically or anthropogenically driven.

Extensive woodland clearance occurred after c. 500 cal BC, characterized by widespread decline in *Tilia* across the region. The impression of an open landscape is supported by aerial photographic evidence, which shows a large number of field systems and enclosures. Many of these appear to be pre-Roman in date and much of the evidence supports continuity of landscape tenure from the Iron Age into the Roman period. Agricultural activities were likely key to extensive usage of the landscape during the Roman period, when we see further evidence of alluviation in the Rivers Idle and Torne floodplains due to increased surface runoff and input into the fluvial systems.

03 REDISCOVERING THE 'WILDSCAPE:' RECONSTRUCTING HIDDEN LANDSCAPES THROUGH A CASE STUDY IN THE HUMBERHEAD LEVELS

Author(s): Shilobod, Nika - Whitehouse, Nicki (Plymouth University) - Gearey, Ben (University College Cork) - Chapman, Henry (University of Birmingham) - Davies, Kimberley (Plymouth University)

Presentation Format: Oral

The Humberhead Levels, located in northeastern England, holds few parallels for its extent of palaeoecological and archaeological work. Today, the landscape appears as a featureless area of flat agricultural land with long drainage ditches crisscrossing the landscape and its small villages. Evidence of the former mosaic of raised mires, heathlands and wetlands can be seen on the remnants of Thorne and Hatfield Moors. Surrounding the Moors are extensive areas of former floodplain wetlands and old river channels, many of which were diverted or canalized during drainage and reclamation works in the 17th century, although some may date as far back as the Roman period.

While there is great evidence for human activity and passage through the region, the archaeology remains still curiously unclear regarding the extent and nature of anthropogenic activity prior to the area's drainage. Many of the archaeological sites and finds for this region can be accredited to antiquarians during the 17th-19th centuries and finds during field walking for the Humber Wetlands Project (1992-2000). It is difficult to draw firm conclusions from these large datasets because of the many uncertainties regarding the questionable proveniencing of the artefacts.

This paper investigates the relationships between wetland and dryland communities through an improved understanding of the spatial distribution of the archaeology and palaeoecology in the Humberhead Levels. Syntheses of palaeoenvironmental records provide an important environmental context demonstrating the landscape's evolution and development, allowing the archaeological datasets to be investigated at a regional scale. Archaeological records are based on the field work conducted by the Humber Wetlands Project. GIS data from this survey, combined with data from the Sites and Monuments Records (SMRs), as well as Historic Environment Records (HERs), and a LiDAR generated DEM are used to uncover spatio-temporal trends of anthropogenic activity over time.

04 TO BE, OR NOT TO BE... FLOODED: IN-SITU SOLUTIONS FOR PRESERVATION OF IRON AGE HUMAN BONES IN A DRAINED WETLAND

Author(s): Kristiansen, Søren (Aarhus University, Department of Geoscience) - Tjellidén, Anna K.E. (Moesgaard Museum)

Presentation Format: Oral

The mass deposition of Iron Age human bone material in the fenland at Alken Enge, Denmark, is internationally extraordinary as an evidence of a large North European Roman Time martial event. However, the site is also problematic seen from a in situ preservation point of view as thousands of archaeological bones are endangered if the present-day environmental conditions continues unchanged.

Here, bones from more than 350 deceased warriors were deposited in a shallow lake in the early 1st century CE. Now, due to >150 years of drainage larger parts of the find have totally deteriorated, and re-establishing permanent reducing and non-bone aggressive geochemical conditions are needed. Parts of the find is still situated in a waterlogged, anoxic peat environment which provides excellent preservation conditions and therefore enables in situ preservation of the human bones. However, as major variations of environmental conditions are found within a few meters, both horizontally and vertically, in situ preservation solutions of the thousands of square meters with human remains is highly challenging if deterioration of all remaining bone material have to be stopped.

In this paper results from a multi-proxy environmental monitoring approach is presented to document spatial variations of present-day threats and bone deterioration rates. The paper discusses best in-situ preservation solutions by comparing solutions from a full-scale natural restoration project which involves flooding the entire area of the prehistoric lake (known and potential find area), to a small-scale solution by regionally regulating the groundwater levels and chemistry within the known find area only.

05 WETLAND PROTECTION WITHIN A NEW ARCHAEOLOGICAL AND ECOLOGICAL CONTEXT: PRESERVATION OF AN UNIQUE IRON AGE HUMAN SKELETAL MATERIAL

Author(s): Hertz, Ejvind (Museum Skanderborg)

Presentation Format: Oral

The target of this paper is to present an overarching archaeological and ecological preservation project running for the last three years with the aim of transforming the Danish Alken Enge wetland site into a "safe store" for a unique assemblage of Iron Age human

remains. This transformation is necessary because Alken Enge have some of the best preserved human skeleton material in Europe from the Iron Age. The skeleton material has been there for 2000 years and much will be lost within a few decades if no environmental in situ preservation mitigation efforts is not introduced within few year.

The bones represent the remains of hundreds of warriors who participated in a major battle just after the birth of Christ. Please read more on: <http://www.museumskanderborg.dk/alken-enge-english-version>. Participants are local museums, municipality, national nature and cultural agencies, and universities.

The site is a 70 hectare of current fenland within a former lake basin with shallow waters in the Iron Age. An urgent and severe problem for conservation is the agricultural drainage that was intensified in the 1950s, which by today have caused decomposition of up to two meters of the peat and gyttja. The layers deposited 2000 years ago, i.e. in the Iron Age, are thus either today lost or situated at very shallow depths, and large quantities of human remains are thus highly endangered.

In this paper, we present on-going efforts to preserve and protect a smaller area where both the bone material lies deepest and are best preserved, and the challenges associated with protection of the much larger area where archaeological bone material are more scattered and more endangered. The various issues that we address are ecological possibilities, national archaeological importance, political considerations, landowner involvement, financing issues, and future site management plans.

06 DIVIDING DUVENSEE. INSIGHTS INTO MESOLITHIC LANDSCAPES AND LIFEWAYS IN NORTHERN GERMANY

Author(s): Groß, Daniel (Centre For Baltic And Scandinavian Archaeology - ZBSA) - Corradini, Erica (Institute of Geosciences, Christian-Albrechts-University Kiel) - Lübke, Harald - Schmölcke, Ulrich - Meadows, John (Centre For Baltic And Scandinavian Archaeology - ZBSA) - Wilken, Dennis - Rabbel, Wolfgang (Institute of Geosciences, Christian-Albrechts-University Kiel)

Presentation Format: Oral

The ancient lake Duvensee is one of the most famous archaeological micro-regions for the Mesolithic in Germany. Discovered almost 100 years ago, several excavation campaigns and surveys were conducted and revealed some of the most intriguing features known from the Preboreal and Boreal in Northern Germany.

Today 23 Mesolithic hunter-gatherer campsites are recorded in the Duvensee bog and 17 of them have been (partly) excavated. While the duration of each camp was apparently very limited in time, the full extent of the Mesolithic occupations at Duvensee span several millennia and encompass notable landscape transformations. Radiocarbon dating sets the establishment of the first known Mesolithic camps within the Preboreal (c. 9000 cal. BC), whereas the youngest Mesolithic occupation was during the early Atlantic period (c. 6500 cal. BC).

In this paper we want to give an overview of current research at Duvensee and highlight some chronological and functional differences between sites, based on updated chronological models and re-evaluations of subsistence strategies. Our understanding of the Mesolithic at Duvensee provides a template for the regional sequence. Furthermore, we will present results from recent geophysical surveys. ERT (Electrical Resistivity Tomography) and GPR (Ground Penetrating Radar), corroborated by coring, distinguish an uppermost layer of peat, the lower most layer associated with the bottom of the lake, and gyttja sediments in between. The investigations were located at the shoreline and revealed the position of prehistoric islands in ancient lake Duvensee, which can be investigated in the near future to find yet unknown sites. Finally, we would like to discuss current developments in and challenges for the archaeological research of the area.

07 THE CASE OF TWO CALCAREOUS SPRING FENS AT THE CARPATHIAN-PANNONIAN INTERFACE IN THE NORTH WEST OF SLOVAKIA

Author(s): Gašpar, Adam (Department of Archaeology and Museology, Faculty of Arts, Masaryk University; ERASMUS MUNDUS - HERCULES Laboratory - University of Evora) - Jamrichová, Eva (Department of Botany and Zoology, Faculty of Science, Masaryk University; Laboratory of paleoecology, Institute of Botany, The Czech Academy of Sciences) - Gálová, Andrea - Horsák, Michal - Frodlová, Jitka - Hájek, Michal (Department of Botany and Zoology, Faculty of Science, Masaryk University) - Hajnalová, Mária (Department of Archaeology, Faculty of Arts, Constantine the Philosopher University in Nitra) - Hájková, Petra (Department of Botany and Zoology, Faculty of Science, Masaryk University; Laboratory of paleoecology, Institute of Botany, The Czech Academy of Sciences)

Presentation Format: Oral

The study area is located in the part of Western Carpathians, where mountain ridges steeply rise from dry and warm Pannonian basin. In the Považský Inovec Mts, two small protected calcareous wetlands occur in different geographical position and contain suitable sediments. One represents a foothill site (initiated ca 13,000 cal. BP) while the other a low-mountain site (initiated ca 7400 cal. BP). We investigated fossil pollen, spores, and macroscopic remains of plants and molluscs from their sediments. We further reviewed archaeological data, calculated Macrophysical Climate Model (MCM) and confronted it with other palaeoclimatic proxies.

Temperate deciduous trees (*Quercus*, *Corylus*, and *Ulmus*) occurred since Allerød, but their expansion was blocked by harsh climate in Younger Dryas when *Larix*, *Pinus*, and *Betula nana* still occurred. The climate firstly moistened at ca 9500 cal. BP and more distinctly at ca 8500 cal. BP, which was reflected by a strong calcium carbonate precipitation and expansion of *Tilia cordata* t., *Hedera helix*, and *Ustulina*. Although the MCM predicted rather stable climate since 8000 cal. BP, certain changes in aquatic mollusc abundances may indicate hydrological fluctuations Younger hydrological fluctuations may be alternatively explained by human activities as they

correspond with macro-charcoal abundance and indicators of wetland openness.

During existence of both fens they harboured only few fen plant and mollusc species specialised to low-productive sedge-moss fens. In the Middle Holocene both sites were encroached by woody plants (*Alnus*, *Picea*, and *Salix*) as most of the other spring fens in the Western Carpathians. Few fen specialists established there even since deforestation, presumably because of a high isolation of these fens and maybe also severe disturbances caused by grazing and/or hemp retting instead of mowing.

08 WETLAND SITE ZAMOSTJE 2 (UPPER VOLGA LOWLAND): LANDSCAPE HISTORY IN THE MIDDLE AND LATE HOLOCENE

Author(s): Lozovskaya, Olga (Institute for the History of Material Culture, Russian Academy of Science, Laboratory for Experimental Traceology; Sergiev Posad State History and Art Museum Preserve)

Presentation Format: Oral

Zamostje 2 is a multi-layered wetland key site with evidences of occupation during the Late Mesolithic, Early and Middle Neolithic and is characterized by a rich bone-antler assemblage and representative wooden inventory.

The modern history of the microregion, where the site Zamostje 2 is located (Dubninsky peatland in the North of the Moscow region), begins with the retreat of the last Valdai glaciation. The lake-marsh lands were inhabited in the Middle Holocene; and this area remained attractive for ancient hunter-fishermen-gatherers from the economic point of view during several millennia: from mid-8th to late 4th mil. cal BC. Though population's activities were largely influenced by climatic and landscape changes, they remained relatively stable throughout the existence of the settlement and later in its vicinity. In historical times hunting and fishing were an important element of local economic life. Written and cartographic sources of the XVI-XX centuries make it possible to trace changes in exploitations of wetlands up to the large-scale reclamation in 1920s. Experiments with peatlands are continuing in our days.

We will present a synthesis of archaeological, paleogeographical, historical and literary (!) data to characterize the peatlands surrounding the site and to explain the significance of this ecosystem for the ancient inhabitants.

09 CHANGE AND CONTINUITY REFLECTED THROUGH MESOLITHIC SITES OF THE GORBUNOVO PEAT BOG IN THE TRANS-URALS

Author(s): Zhilin, Mikhail (Institute of Archaeology Russian Academy of Sciences) - Savchenko, Svetlana (Sverdlovsk Regional Museum)

Presentation Format: Oral

The Gorbunovo peat bog is situated in Sverdlovsk province of Russia, in the Trans-Urals. Ten Mesolithic sites were registered there. Excavations of three multilayer peat bog sites Beregovaya I, II and Seryi Kamen with good preservation of organic materials conducted by the authors in 2008-2017 revealed find layers dated to Early, Middle and Late Mesolithic and the beginning of the Neolithic. Archaeological and natural scientific data obtained during these excavations make possible reconstruction of environmental history and settlement of the area from Early Preboreal to Early Atlantic periods. The first settlement episode at Beregovaya II site occurred in the beginning of the Holocene about 9900 BP during Early Preboreal lake regression. During the middle of the Preboreal period lake level was not stable. The bottom find level of Beregovaya I site is dated to the interval 9600-9300 BP. At the end of this period during a short lake regression traces of some activity are registered at both Beregovaya I and II sites. Sharp rise of water level about 9150 BP led to formation of a sterile streak of gyttja which sealed these find levels. The next settlement episode in the first half of the Boreal period about 8900-8500 BP is recorded at Beregovaya I, II, and Seryi Kamen. The water level remained high with a peak about 8450-8400 BP. During the end of the Boreal period about 8390-8000 BP regression and gradual swamping of the lake started. Late Mesolithic find levels of these three sites and Early Neolithic find levels of Beregovaya II and III are embedded in peat deposits. The paper will focus on tracing changes and continuity in environmental history, settlement patterns, subsistence strategies and material culture of the population of Gorbunovo peat bog during three millennia.

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BEYOND THE FARMLANDS: WILD RESOURCES IN THE PAST OF CENTRAL AND NORTHERN EUROPE

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Slusarska, Katarzyna (Institute of Archaeology and Ethnology University of Gdańsk) - Mooney, Dawn Elise (Universitetet i Stavanger Arkeologisk museum) - Przymorska-Sztuczka, Magdalena (Institute of Archaeology Nicolaus Copernicus University in Torun) - Kofel, Dominika (The Institute of Archaeology and Ethnology Polish Academy of Sciences)

Format: Regular session

Our classical narratives hinge on the concept that the adoption of food production techniques based on agriculture and animal husbandry has fundamentally changed the relationship between humankind and nature. While this made humans less dependent on natural resources through control of their own food supply, it tied them to a specific place for a longer period of time. However, in regions with poor soils and relatively short growing seasons, such as the North European Plain and Scandinavia, overall food acquisition strategies remained diverse long after the introduction of farming. Wild resources, even in quite recent times, were sought-after and commonly present in the everyday life of

European rural communities: as a source of food including delicacies, and as raw material for making tools, containers, clothing. Despite this, archaeological narratives concerning the Neolithic and later periods usually fail to consider the role of wild resources in the economy of that time.

This session aims to bring together archaeological, archaeobotanical and zooarchaeological perspectives to develop a more integrated approach to Neolithic and post-Neolithic subsistence strategies.

Possible topics include:

- The contribution of the wild food to the diet - regular supply or hunger marker?
- Wild sources of fibres and leather for textile and container production.
- Gathering wild resources for human consumption or/and animal winter fodder.
- Natural dyes and adhesives
- Plant-based construction materials
- Fishing, small vertebrate hunting, and invertebrate gathering

Regional summaries, detailed studies of single sites or deposits, and experimental studies are equally welcome.

ABSTRACTS

01 BETWEEN THE CURRENTS. MAINTAINING MESOLITHIC WAYS OF LIFE IN NEOLITHIC WESTERN NORWAY

Author(s): Darmark, Kim - Solli, Fredrik - Tøssebro, Christine - Åstveit, Leif Inge (University Museum of Bergen)

Presentation Format: Oral

The Norwegian west coast is an archipelago that has attracted people throughout prehistory. Stone Age settlements in the region have a tendency to cluster around narrow streams, which are particularly rich in marine food resources. Domesticates do not seem to contribute substantially to the economy until the very end of the Stone Age. Changes in the material culture, however, indicate cultural contacts with agricultural societies.

Ongoing excavations of multiphase sites located on the Sotra islands in the outer coast, west of the city of Bergen, cover the span from the Early Mesolithic up to the Late Neolithic. These clearly illustrate a continued heavy reliance on fishing, fowling and hunting of marine mammals in the region. The thick cultural layers contain large amounts of finds, primarily lithic debris and tools, but also faunal remains. Pottery appears in the later stages. The finds and features uncovered give testimony to a periodically very intensive exploitation of the marine environment, and are presented against a backdrop of earlier knowledge. However, the new data also indicates periods of less activity and settlement breaks of hundreds of years, which give reason to challenge prevalent notions of a steady and gradual growth in sedentism and territoriality on the northern fringes of early European agriculture.

02 WHALING IN NEOLITHIC NORWAY: THE DE-NEOLITHISATION HYPOTHESIS REVISITED

Author(s): Nielsen, Svein (Museum of Cultural History, University of Oslo)

Presentation Format: Oral

The Neolithic in southern Norway is recognised by the introduction of the Funnel Beaker Culture (TRB) around 3900 BCE at open-air occupation sites distributed from the easternmost region to the western coast. Though the local adaptation of this early farming complex is yet to be fully understood, evidence now points to a collapse within the Nordic TRB at the Middle Neolithic transition around 3400-3100 BCE. Earlier research proposed that TRB farming was not feasible in the Norwegian environment, and that the newly settled TRB responded by slowly orienting its economy towards an intensified exploitation of wild resources: fishing, hunting and gathering – in other words a process of de-Neolithisation. In Denmark and Sweden, this new tradition is known as the Pitted Ware Culture, in Norway as the Cord Stamp Culture. This paper explores how the TRB adapted its livelihood in southern Norway, following the Middle Neolithic collapse. A previously unpublished assemblage of artefacts and unburnt bones initially discovered in a peat bog at Jortveit (Skagerrak coast, southern Norway) in 1929 is presented. The Jortveit assemblage shows a variety of well-preserved organic and lithic hunting tools as well as faunal remains including large sea mammals, indicating the importance of collective hunting of marine resources in the Middle Neolithic. These findings are discussed in relation to further evidence of de-Neolithisation in southern Scandinavia.

03 FISH AND CHAPS: SOME ETHNOARCHAEOLOGICAL THOUGHTS ON FISH LEATHER USE IN EUROPEAN PREHISTORY

Author(s): Vávra, Roman (Department of Archaeology, Comenius University in Bratislava; Slovak Archaeological and Historical Institute - SAHI o.z.)

Presentation Format: Oral

Throughout history humanity has utilised a wide range of animal products. One of the primary animal products requiring the animal

to be slaughtered is skin, used either raw or processed, for instance by tanning into leather. The hides of wild or domestic mammals were most commonly used for making leather. Despite rich ethnographic evidence, one leather type remains as a rule ignored in European archaeology: fish leather.

Granted, leather is not often preserved at European sites, and fish leather finds are extremely rare. Like a large portion of artefacts made from perishable materials we can only postulate the possibility of their presence from indirect evidence. Nevertheless, the possibility exists and should not be forgotten when interpreting the archaeological record and building our narratives.

In this talk I will first present the basic facts and properties of fish skin and fish leather. Traces of fish leather manufacture and use (or their absence) will be discussed with regards to their potential for preservation. Against a backdrop of living examples from traditional art and clothing, I will present some remarks on the possibility of fish leather use in prehistoric continental Europe.

The study is supported by Slovak Research and Development Agency (APVV) using financial support no. APVV-14-0550.

04 WILD RESOURCES IN THE SOUTH BALTIC LATE BRONZE AND EARLY IRON AGE - NOT IMPORTANT, NOT PRESERVED OR NOT ANALYZED?

Author(s): Slusarska, Katarzyna (Institute of Archaeology and Ethnology University of Gdańsk)

Presentation Format: Oral

The problem of "wild resources" in the economy seems to still occupy a marginal position in the discussion of post-Neolithic cultures in the Central European lowlands. Much more attention is paid to cereal crops and animal breeding strategies. Considering environmental conditions and the presence of wild resources in everyday economy even in recent times, this exclusive approach could distort our vision of the past. Excluding inadequate archaeological fieldwork practices, there are several possible reasons for this bias: firstly, the state of preservation. The generative or vegetative parts of plants can be preserved either by charring (when the storage or processing involves high temperatures) or waterlogging (especially in alkaline conditions). Wild animal remains can be preserved provided their bodies contained robust elements such bones or shells, and a large part of the animal body was transported into settlement area.

In recent years we can observe increasing interest in the contribution of non-cultivated plants and wild animals to diet and economy in the late Bronze and early Iron Age, possibly due to the involvement of more experts in biological sciences in research. This kind of cooperation creates new possibilities for more detailed studies. For example, the increasing number of *Chenopodium* seed assemblages discovered in settlement contexts opens the discussion of whether these plants were gathered from the wild or cultivated. Furthermore, frequent finds of acorn and mollusc shell deposits engender a reconsideration of the reason why they were collected: as animal fodder, or for human consumption?

This paper sums up the current state of discussion on the contribution of wild plants and animals to the diet of humans and domesticated animals in the south Baltic region.

05 IN WOODLAND WE TRUST. CHARCOAL ANALYSES FROM THE EARLY BRONZE AGE SITES IN POLAND

Author(s): Kofel, Dominika (Institute of Archaeology and Ethnology PAS)

Presentation Format: Oral

Trees are essential to human life, as producers of oxygen and as building, fuel and food resources. Therefore, amongst archaeobotanical material it is charcoal that is most frequently collected during archaeological excavations. The analysis of this material contributes to our understanding of the landscapes surrounding archaeological sites and the changes they have undergone during human occupation.

Archaeobotanical studies of charcoal remains were conducted on material collected at three Early Bronze Age sites from the south-west Poland: Pietrowice Wielkie 13, Radłowice 22, and Dzielnica 17. They are located on the fertile soils of the Silesian Lowland and each of them represents a different type of archaeological site. In two instances, features resembling ditches were uncovered during the excavations. In the case of Pietrowice Wielkie 13 these were interpreted as being connected with a defensive function, whereas the ditches at Radłowice 22 were thought to be of an economic (water reservoirs) or pragmatic (land improvement) function. Nevertheless, whether the ditches were of a defensive or practical nature, the sites surrounded by them are considered as having a "special meaning" due to the extend and depth of the structures around. At the third site, Dzielnica 17, graves from the Unietice culture were discovered.

Charcoal assemblages collected from these three sites provide the basis for discussion. Although the sites are varied and the charcoal samples were taken from a variety of features, the species composition at all three sites was surprisingly similar. The presentation will explore questions of woodland composition, wood selection for different purposes, and the taphonomic processes that occurred at the analysed sites.

06 NETTLE AS A TEXTILE FIBRE PLANT IN FINLAND

Author(s): Suomela, Jenni (University of Helsinki)

Presentation Format: Oral

Recent research has revealed that stinging nettle (*Urtica dioica*) has been used as a textile fibre in Northern Europe since Neolithic

times. This study concentrates on nettle fibre finds, in textiles, in under-researched areas of Finland and its surroundings. The bast fibres that are known to be used for textiles in Northern Europe are flax, hemp, and nettle. Among these, only nettle is native to Finland. There is no ethnological evidence that it would ever have been cultivated: instead, wild resources were exploited. Because nettle thrives in nitrite-rich soil, it grows abundantly around human settlements and is easily available.

Archaeobotanical investigations of pollen remains have shown the early occurrence of nettle in Finland, but this does not prove its usage in textiles. Through methodological improvements it has become possible to distinguish nettle from other bast fibres by optical microscopy. In this research, the identification is done by the methodological combination of observation of surface characteristics, a modified Herzog test, and cross-sectioning.

The soil in Finland is acidic, which means that cellulose-based fibres decay easily. Metallic salts, for example from bronze spiral decorations on clothing or other ornaments, have often functioned as a preserving agent for the fibres to survive to modern times. The materials analysed here consist of recently identified nettle textile finds from the 12th to 19th centuries AD. Both archaeological and ethnographic evidence is included and results are compared to the larger North European framework. The aim is to understand how common this lesser-known textile material has been, and also why its utilisation has died out.

07 TREE BAST STRING FROM LUSATIAN CULTURE SETTLEMENT IN GRODNO, POLAND

Author(s): Przymorska-Sztuczka, Magdalena (Institute of Archaeology Nicolaus Copernicus University in Toruń)

Presentation Format: Oral

The literature emphasizes the importance of thousands of years of experience in the field of basketry and braiding, which undoubtedly must have had an influence on weaving technology. Usually, grass stalks and reeds, as well as roots and tree bast were used in these techniques to produce various types of mats and containers. Artefacts made of tree bast from the Bronze Age and the early Iron Age Poland, are extremely rare. However, this does not mean there were no objects made of bast at these times. This is due to various causes such as the state of research, the state of publication, and the methodology implemented during excavations and fact that tree bast artefacts are rarely preserved except under exceptional conditions. At present there are only 3 artifacts made of tree bast, that can be dated to the Polish Bronze Age and Early Iron Age. These are a binding from an arrowhead from Śmiardów Krajeński (from the early Bronze Age), a string attached to a bone comb (from the unique find of the so-called 'Drwęcko Girl' bog body, associated with the West Baltic Barrow Culture), and a string discovered at the Lusatian culture settlement in Grodno. This paper presents this last artefact, as well as the methods involved in acquiring and processing tree bast.

a. WILD ANIMAL RESOURCES IN GUMELNIȚA COMMUNITIES (4500-3900 CAL.BC) IN ROMANIA

Author(s): Balasescu, Adrian ("Vasile Pârvan" Institute of Archaeology, Romanian Academy, Bucharest) - Lazar-Radus, Catalin Alexandru (Department of Ancient History, Archaeology and Art History, Faculty of History, University of Bucharest; "Vasile Pârvan" Institute of Archaeology, Romanian Academy, Bucharest)

Presentation Format: Poster

Compared with other prehistoric groups in Romania, more zooarchaeological data is available from the Gumelnița culture sites due to intense research carried out on the settlements and cemeteries of these past communities.

The significant quantities of faunal material recovered from various sites reveal differing strategies in the exploitation of animal resources. An unusual feature of these human populations is that the importance of hunting is substantially increased in the final stages of the Gumelnița culture, to the detriment of animal husbandry and agriculture. There are seven documented settlements where the proportion of wild faunal remains exceeded 50% (NR). Moreover, in most of the Gumelnița sites, wild mammals represent over 15% of the faunal assemblage. In these circumstances, it is clear that hunting activities played an essential role in the animal palaeoeconomy of Gumelnița communities. This fact becomes more evident when compared to data from earlier cultures from the Middle/Late Neolithic or Early Eneolithic. On the other hand, the animal economy in the Gumelnița populations is similar to that of the contemporaneous Sălcuța communities from southwest Romania. This intensification of hunting in the Middle/Late Eneolithic is a widely visible phenomenon in the northern Balkans, but it is difficult to explain.

One of the possible causes that might have led to the rise of hunting and increase of wild mammal proportions in those human communities is changing climate, which could have dramatically influenced vegetation, thus altering animal habitats. Such climatic changes could have affected grazing and agricultural lands, and under these circumstances human communities of the Middle/Late Eneolithic had to adapt themselves to the new environmental conditions and begin to exploit other sources of food.

This work was supported by a grant of the Romanian Ministry of Research and Innovation, UEFISCDI, project number PN-III-P4-ID-PCE-2016-0676, within PNCDI III.

b. WILD RESOURCES AT THE SITES OF CATTLE-BREEDERS OF THE LOW VOLGA REGION

Author(s): Vybornov, Alexander (Samara State University of Social Sciences and Education)

Presentation Format: Poster

Among the remains from the cultures of the Low Volga region from 6200 to 5300 BC (the Orlovskaya and Seroglazovskaya cultures) only wild animals bones were found, including kulan, saiga, tarpan, aurochs, red deer, boar, gazelle and wolf. The only domestic species is a dog. About 5200 BC, bones of domestic sheep and goats were found from the Caspian Sea region culture in the Low Volga

region. The presence of cattle breeding is confirmed by the analysis of lipids from the residues on ceramics. However, apart from the sheep bones, wild animal species constitute a significant percentage of the assemblages. Arrowheads are also represented in a large number, and there is evidence that hunting was conducted all year round. Around 5000 BC, evidence of cattle appears along with sheep at sites of the Khvalynskaya culture. The presence of dairy products is again confirmed by lipid analysis of ceramic residues. Nevertheless, even at sites from around 4500 BC wild animal species still predominate: only aurochs disappears. In addition to regular hunting there is evidence of fishing in the form of bone harpoons and hooks. The analysis of fish bones demonstrates the year-round nature of fishing. There is also evidence of gathering. Thus, the contribution of wild food to the diet of the Caspian Sea region and Khvalynskaya cultures was significant. Some remains of dwellings were found at the sites of the Khvalynskaya culture, which indicates a greater sedentary character compared to earlier cultures. In contrast to earlier periods, the seasonal mobility of the population is recorded in the semi-desert and steppe regions of the Low Volga region from 5200 - 4500 BC. This can be explained not by cattle breeding, but by a change in seasonal precipitation cycles.

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PRECIOUS MATERIALS AND FINE METAL WORK IN THE EUROPEAN IRON AGE - FUNCTION, AESTHETIC AND TECHNOLOGY

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Armbruster, Barbara (CNRS - Laboratoire TRACES - UMR 5608) - Fürst, Sebastian (Curt-Engelhorn Center Archaeometry - Mannheim) - Nordez, Marilou (CNRS - Laboratoire TRACES - UMR 5608) - Schwab, Roland (Curt-Engelhorn Center Archaeometry - Mannheim)

Format: Regular session

Luxury objects are an important part of European Iron Age material culture. This is reflected in personal ornaments, decorated weapons, vessels, wagons and furniture, etc. This session deals with materials such as gold, silver, bronze, enamel and glass as well as organic materials, such as ivory, coral, amber and jet. These luxury materials played an important role in social, religious, economic and artistic terms that we would like to discuss.

Our session offers the opportunity to compare the trade and exchange systems of different precious materials in diverse parts of Europe. As different as the materials are, as unequal is their value. Hence, different raw materials have been accessible for different social groups; this is why the distribution patterns of different raw materials allow us to establish a more detailed reconstruction of the economic systems during a certain period and to trace the chronological dynamics in this context. Moreover, since raw materials are always closely interrelated with networks of production and consumption, their distribution patterns and dynamics enable profound insights into the circulation of the ideas and people behind the materials.

Our aim is to bring together research dealing with different aspects of these prestigious materials and objects combining social anthropology, archaeological context, style, arts and crafts, technology and archaeometry. Therefore, we invite contributions concerned with interdisciplinary approaches to precious materials and fine metal work.

ABSTRACTS

01 TEXTILES AS PRESTIGE GOODS IN CENTRAL EUROPE 800-400 BC

Author(s): Groemer, Karina (Natural History Museum Vienna, Prehistoric Department)

Presentation Format: Oral

The cultural and historical importance of textile technology, especially of spinning and weaving, can hardly be overstated. Textile crafts not only produced essential goods for everyday use, most notably clothing, but also utilitarian objects as well as representative and luxury items.

This is illustrated by a variety of archaeological sources – from tools and original textile finds to contemporary depictions and written sources of the Late Iron Age. Some key finds can be named in this context: the saltmines from Hallstatt and Dürrnberg in Austria; as well as the princely graves from Hochdorf and Hohmichele in Germany.

The Hallstatt Period fabrics are of high quality, and decoratively designed by weave structures, colours, patterns and elaborately made borders. Also luxurious textiles with imported insect dyes are known. Within Early Iron Age, even the interplay between textiles and metal objects attached on them reaches a very high standard (up to woven-in gold stripes) – expressing wealth and beauty. So the visual complexity of textile objects, with bright colours and interesting patterns, can be proved, at least by original textile finds from the salt mine Hallstatt. This development was perhaps fostered by the emergence of differentiated social structures at the beginning of the Iron Age.

A fundamental question asked in the following paper is: why there was a development in textile crafts at all. After the invention of the basic techniques to produce fabrics for various uses, why people made a lot of steps forward and invested time, skill and know

how to decorate them, to add quality. Here a theory coming from psychology and neurosciences is the basic framework to shed some light on that – Abraham Maslows concept about human motivation, the so called “hierarchy of needs” can help to understand the motivations behind developments in textile production

02 THE GLITTER OF GLASS: USING PRODUCTION SYSTEMS TO APPROACH THE VALUE OF GOODS

Author(s): Rolland, Joëlle (Umr 8215 Trajectoires; Umr 5060 IRAMat/Ceb)

Presentation Format: Oral

Because they are what others perceive of us and what we choose to show others, clothing and ornaments are elements of the relationships between individuals. Personal ornaments become a system of visible signs. Since only members of the community can read the dress and jewellery codes of their system, they foremost express a collective identity. As we are not part of the societies of the European Iron Age, we must decipher the codes that will allow the reading of the ornaments, such as the value and the meanings they may convey. Glass is a common material nowadays and glass ornaments circulating in the Second Iron Age have been regarded as relatively affordable ornaments for long, as they may be imitating precious stones or gold. However, thanks to archaeometric and technological approaches, the identification of long-distance exchange networks of raw materials and the reconstitution of the production and consumption system of Celtic glass ornaments allows us to reconsider its value. The purpose of this communication is to offer a reflection on the value of glass objects and their meanings for La Tène societies. Exotic, bright and sonorous, glass must be considered as a luxury material. However, the study of the technological and quantitative evolution of glass production throughout the five centuries of the Second Iron Age allows us to perceive evolutions in the accessibility, and therefore in the value, of these objects whose status could switch from a luxury object to a high-end object. Either luxury or high-end, glass ornament is a marker of wealth, an object of distinction whose development seems to follow the evolution of La Tène societies and the metamorphoses of its wealth. As such, glass is an excellent medium for the study of economic and exchanges systems of ostentatious goods in the La Tène world.

03 THE VALUE OF BEADS, SYNTHETIC JEWELS – TRINKETS OR TALISMANS?

Author(s): Råhlander, Moa (Stockholm University)

Presentation Format: Oral

Beads are numerous but valuable objects with long lifespans and a strong connection to the dress and body of the Scandinavian Iron age. What are the values embodied in the collection, curation and carrying of beads made from glass and stone?

This paper will introduce a new PhD project using the author's experience as a skilled bead maker to investigate processes of bead production and mechanics of bead collection current in Scandinavia in the period of 4th-12th century AD. The aim is to create a relative scale of value between beads. A better understanding of who wore them and the contemporary perspectives on the materials.

Glass is a strange material, sharing qualities with both metals and gemstones. Early cuneiform sources describe it as artificial lapis lazuli: are glass beads considered false gems or a material where technology surpasses the natural? What created the growing demands for these ornaments for 800 years, just to have them disappear when a new religion gets its hold?

In the study the bead collections from several Swedish burial sites will be examined and compared from the perspective of their production techniques, materials, and damage from wear and cremation. This typological information is complemented by chronologies, literature studies and comparison between the different ways beads was used. Special attention is paid to the curation, mending and augmentation of broken beads.

04 LUXURY FOR THE MASSES - RED CORALS AS AN INDICATOR FOR INTERCULTURAL CONNECTIONS AND SOCIAL DYNAMICS

Author(s): Fuerst, Sebastian (Curt-Engelhorn-Centre Archaeometry gGmbH Mannheim)

Presentation Format: Oral

In comparison with other kinds of imports from the Mediterranean, like Greek pottery or Etruscan bronze vessels, Corals have a number of special traits: they were constantly imported over a long period (from the end of the 8th to the 2nd centuries BC); thus, the find distribution is very dense, and the group of consumers includes not only the upper class, but extends also to a kind of “middle class”. Furthermore, it is the only archaeologically visible Mediterranean import that came towards the north as a raw material.

These features offer a heuristic potential for developing more complex interaction models between and within cultures when it comes to trade routes, distribution systems, social structures or consumption practices.

From a transcultural perspective, the differences between the distribution patterns of corals and other Mediterranean imports seem to reflect a more complex fluctuation of trade goods as part of (at least partially) independent trade systems.

Furthermore, from the second half of the 6th until the 5th century BC, clusters of dense coral finds appear, which might indicate hotspots for trade goods. However, it was not only the Central Places, the so-called “Fürstensitze”, where corals have been found. Especially at the End of the Hallstatt period, during the first half of the 5th century BC, many pieces – even clear production relicts – have been unearthed from rather small rural settlements throughout the last years, challenging our understanding of Mediterranean imports and centrality.

From an intracultural perspective, we can trace the sometimes striking changes in coral consumption as the increase of corals from male warrior graves during the second half of the 6th century BC or the trend of a localization of coral jewellery and crafting techniques during the 3rd century BC.

05 GOLD AND BRONZE ANNULAR ORNAMENTS IN LATE IRON AGE

Author(s): Nordez, Marilou (CNRS)

Presentation Format: Oral

During the Late Iron Age, annular ornaments (bracelets, armllets, anklets, torcs and finger rings) made in precious metals are particularly well represented. They are mainly discovered in hoards, sanctuaries or funeral contexts, often mentioned by Greek and Roman texts and represented on anthropomorphic figures. This large variety of discovery contexts and the diversity of sources available could extend our understanding of how they would be worn and a glimpse on their symbolic status.

Indeed, personal ornaments, such as annular ones, are powerful tools of non-verbal communication in most traditional societies, and probably most late prehistoric societies. Their morphology, decoration, association and arrangement on the body form complex sociocultural codes, which could be instinctively decrypted by the wearer's contemporaries who share the same codified social language. They participate to a symbolic projection of the individuals and their status within the group, while materializing shared and collective values. One of the aims of this presentation will be to consider the wearers themselves, especially through ethnographic comparisons.

A close look to the morpho-typology of these annular ornaments, through the analysis of their ergonomics, clasp and closing system, size and weight, allows comparisons with iconographic and funeral data, in an attempt to discuss the ways they were worn. Particular attention will be paid to the decoration: precise study of the shape of figurative or non-figurative patterns and their organization highlights the identity character of symbolic codes, revealing the influence of regional or micro-regional groups in their spatial distribution.

06 LOOKING GOOD DEAD. PXRF ANALYSIS AT THE ASSEMBLAGE LEVEL AND THE EPHEMERAL NATURE OF SOME COPPER ALLOY BURIAL GOODS

Author(s): Kovacik, Joseph (Éveha études archéologiques) - Save, Sabrina (Amélie SARL) - Filippini, Anne - Mamie, Antoine - Bernard, Marion (Éveha études archéologiques)

Presentation Format: Oral

Radivojevic et al. (2017) recently argued that innovation and progress in metallurgy is primarily driven by a search for specific colors, brilliance, or other visually pleasing aspects of metal, while Arnold (2016) has reflected on weather personal adornment found in burials is transitory, with at least some objects accompanying the deceased worn on a regular basis prior to death. Taken together it is clear that in funerary contexts, metal artefacts are endowed with more than accumulated wealth, as they accompany the living during the burial of the deceased, and the defunct on their journey in the after after-life, making them "look good dead".

At the Iron age site of Vandières, eastern France, we used portable X-ray spectrometry to analyze the chemical composition of the complete copper alloy burial assemblage from 52 burials, comprising two hundred and eight objects including : 92 bracelets, 62 leg rings, 33 fibulae, 9 torques, 9 beads, 1 pin, and 1 pendant. In most of the graves the items were deposited as paired sets - a pair of bracelets, of leg rings, or fibulae. Our initial objective was to determine if there these pairs were part of larger "lots" of objects, either within individual or groups of graves, using this information to investigate if these ornaments were acquired as a set, or were accumulated over time. While affirming the presence of numerous lots, the data also indicated that a large portion of the objects, while initially classified in the field and in the lab as copper alloys, were in fact primarily composed of tin and lead with relatively low concentrations of copper, and as such are likely to have been purchased specifically for burial.

07 NEW PERSPECTIVES ON THE TECHNOLOGY AND FUNCTION OF IRON AGE GOLDWORK: THE RECOUSO TREASURE (NW IBERIAN PENINSULA)

Author(s): Armada, Xose-Lois - García-Vuelta, Óscar (Institute of Heritage Sciences, Spanish National Research Council, Incipit - CSIC) - Scrivano, Simona (Departamento de Física Atómica Molecular y Nuclear, University of Seville; Centro Nacional de Aceleradores - CNA)

Presentation Format: Oral

The so-called "Recouso treasure" is one of the most important finds of the renowned Iron Age goldwork from NW Iberia. This hoard, found by chance at the beginning of the 1920s, is composed of 16 decorated earrings, some of them with associated hanging elements (ornamented terminals, rings and "loop in loop" chains). It also comprises several fragments of these elements, as well as three ingots and a melting mass made of a Au-Ag-Cu alloy.

On the basis of a topographical study, a multi-analytical approach has been undertaken in recent years, including handheld-XRF and micro-XRF analysis, scanning electron microscopy (SEM-EDS), radiocarbon AMS dating of the identified charcoal remains, and the characterization of interior fillings using pyrolysis combined with gas chromatography and mass spectrometry (Py-GC-MS).

Our results allows for a deeper understanding of Late Iron Age gold manufacture and function. The earrings of the same morphology can be divided into two main groups depending on their lateral surface decoration technique (filigree or granules), which confirms technological variability as one of the main features of this craft tradition. The alloy recipes, the soldering techniques and other

manufacturing processes are also addressed. Our paper also aims to discuss other issues such as the use of a non-metallic core material and the intense surface wear of the objects.

Although the Recouso earrings are usually interpreted as ear adornments, we should not rule out that in cases such as this they may have been part of more complex adornments. The context of the find points to a goldwork deposit or an area of metallurgical activity, as can be inferred from the fact that some pieces (ingots, melting mass, touchstone...) can be linked to working processes, while others show traces of use and repair, suggesting they were destined for recasting.

08 TECHNOLOGICAL STUDIES OF IRON AGE GOLD WORK DECORATION

Author(s): Armbruster, Barbara (Centre National de Recherche Scientifique)

Presentation Format: Oral

The archaeological record of the European Iron Age witnesses of an important production of gold work, in particular of personal ornaments, decorative elements and vessels. Most of the abundant gold artefacts are richly decorated. This paper deals with the technological knowledge of the artisans referring to the various different fine metal working techniques used for the embellishment of the precious items. It aims in scrutinising traditions and innovation visible in the technological choices made by the Iron Age goldsmiths through a diachronic perspective. The large variety of techniques includes various kinds of cast, chased, punched, pressed, cut, twisted and applied (granulation and filigree) decoration. The latter are realised with different kinds of soldering as a joining technique. Furthermore the tools and materials needed in Iron Age precious metal working workshops for the execution of these techniques will be discussed. Tool mark analyses, experimental archaeology, ethno-archaeology and data from material science are part of the interdisciplinary methodological tool kit applied in this study. Case studies, starting from the roots and early traditions of decorative techniques in the Late Bronze Age, passing by the development of decoration techniques during the West Hallstatt period and up to the La Tène culture, will illustrate the statements.

09 THE COMING OF SILVER TO THE IRON AGE: FIRST ARCHAOMETALLURGICAL IMPRESSIONS FROM ITALY

Author(s): Schwab, Roland (Curt-Engelhorn-Zentrum Archäometrie) - Babbi, Andrea (Römisch-Germanisches-Zentralmuseum Mainz) - Pernicka, Ernst (Curt-Engelhorn-Zentrum Archäometrie)

Presentation Format: Oral

Silver is generally rare in archaeological contexts of prehistoric Europe before the arrival of the Romans, but its regional distribution is very different through the ages. In the Aegean, for example, it is well represented from the 3rd millennium BC onwards, with an emphasis in the Classical period. On the Iberian Peninsula, the use of native silver began in the early 2nd millennium BC with a significant production of silver from argentiferous ores. The Italian Peninsula is in between those two major silver producing regions and Greek colonies like Cumae let assume a close economic relationship with the Greek homeland, whereas Phoenician activity is also likely. The examination of the silver objects from Cumae, Grave Artiacco 104 from the end of the 8th c. BC, which has been part of an international research project (directed by Andrea Babbi) is therefore an outstanding opportunity considering these questions and an important step in closing our gap in the knowledge about metallurgy and metal trade in the early Iron Age. The examination of several objects showed, that most of them consist of more or less unalloyed silver with no retained cold work. The lead isotope ratios of most samples are quite similar and form a homogeneous group, which is definitely not matched by local Tuscan or even Aegean ores, but rather match the lead ores from southern Spain

265 LEAVING NO STONE UNTURNED: WHAT ARCHAEOLOGY MEANS TO UNSUSTAINABLE URBAN GROWTH

Theme: Archaeology and the future of cities and urban landscapes

Organisers: Vis, Benjamin (University of Kent) - Isendahl, Christian (University of Gothenburg) - Graham, Elizabeth (University College London)

Format: Other - combination of regular session and round table

People face global challenges unprecedented in human history. The complex system of human-environment interactions highlights problems resulting from crucial interconnected trends. These include population growth, rapid urbanisation which is alarmingly outpaced by the expansion of urban land cover, a decreasing ratio of food producers to food consumers, and increasing soil degradation. These conditions create a truly critical developmental dynamic that casts our future in a bleak light. Calls that emphasise the need to develop knowledge-based plans for sustainable urban growth are not only urgent and understandable, but will prove to be ill-informed pipe dreams if negative trends are not reversed.

One way to counteract the quandary that global processes confront us with is to design solutions at the local scale that are appropriate to local conditions. Archaeology is increasingly revealing past tropical urban development patterns. These alert us to long histories of radically different kinds of urban planning, design, life and ecological relations. In this session we invite contributions that seek to critically operation-

alise current insights and evidence from the archaeology of tropical cities across the globe. What do ancient tropical urban conditions have in common? How are alternative social and ecological relations manifested in distinctive developmental trajectories and do they display causal consistencies in urban form? How has past tropical urbanisation affected long-term environmental dynamics, and how were changes managed in urban life and governance? Ultimately, how can we present and use the distinctiveness of the archaeological-material evidence-base for indigenous urban vernaculars to inform global sustainable urban development debates?

ABSTRACTS

01 SUSTAINABILITY VIEWED THROUGH TROPICAL URBAN ARCHAEOLOGY

Author(s): Vis, Benjamin (University of Kent) - Isendahl, Christian (University of Gothenburg) - Graham, Elizabeth (University College London)

Presentation Format: Oral

When the past is perceived as isolated from the future, insights from archaeology stand on shaky ground. When Dawdy (2009) was invited to consider the question 'is archaeology useful?', she put forward a case for a 'future oriented' archaeology. This positions archaeological knowledge to meet the contemporary challenges that arise as human inhabitation expands and societies develop the world. Our session is inspired by the activities of the TruLife (Pre-Columbian Tropical Urban Life) Research Network, in which the knowledge derived from Pre-Columbian Maya tropical urban archaeological research is applied to urban design to address the challenge of improving the sustainability of the conditions of urban life. Archaeologists are more prone to be convinced by potential genealogical links that connect archaeological and contemporary cities than those in other fields. Given the rift between tropical archaeological urban traditions and contemporary urban development, facilitating radical comparisons in 'diptychs' — to paraphrase Dawdy (2009: 140) — may prove more effective than arguing genealogical links to stimulate creative problem solving.

We will introduce what has been gleaned from TruLife's multidisciplinary exchanges and view questions of sustainability through the lens of tropical urban archaeology. We will rethink the human-environment paradigm to highlight perspectives, processes, data, and research approaches that are amenable to a future-oriented archaeology. We will ask how we can apply what we learn from archaeology to improve long-term human-environment relationships to meet current urban and urbanisation challenges. How can the results of archaeological research contribute to the UN's Sustainable Development Goals? How can we devise archaeological developmental insights that are accepted as pertinent beyond the discipline? Current urban development features a range of unsustainable practices. When archaeological research can identify the key mechanisms which effected humanity's diverse successes in adapting through change, it has the potential to empower future urban development.

02 URBAN PLANNING IN PRECLASSIC MAYA CITIES

Author(s): Reese-Taylor, Kathryn (University of Calgary) - Anaya Hernández, Armando (Universidad Autonoma de Campeche) - Dunning, Nicholas P. (University of Cincinnati) - Walker, Debra S. (University of Florida) - Peuramaki-Brown, Meaghan (Athabasca University)

Presentation Format: Oral

In the Maya lowlands, the transition from the Middle to the Late Preclassic (ca. 400-200 BCE) is the period during which urban landscapes first appeared throughout the lowlands. Given their long-term success, Maya urban centers appear to embody qualities associated with resiliency, sustainability, and careful planning. However, the nature and degree of the planning involved, especially in the initial creation of urban and peri-urban zones, remain undetermined. According to Jane Jacobs, a centralized planning regime draws upon the "expert" knowledge of an individual or a small group to make decisions, while decentralized planning relies on "local" knowledge and integrates people from various social groups into the planning process.

In this paper, we explore the urban planning process during the Preclassic by examining two distinct examples drawn from the cities of Nixtun Ch'ich', Peten, Guatemala and Yaxnohcah, Campeche, Mexico. Interestingly, the degree of nucleation seen at Nixtun Ch'ich' is in stark contrast to Yaxnohcah, which is a poly-centric, "edgeless" Maya city. This difference indicates that reliance on centralized or decentralized planning regimes may have varied widely throughout the lowlands. More importantly, however, we argue that the continuing viability of Maya cities depended on establishing flexible and multi-scalar strategies as cities first arose.

03 PRECOLUMBIAN ANDEAN CITIES AS URBAN ECOLOGIES: THE CASE OF TIWANAKU

Author(s): Janusek, John (Vanderbilt University)

Presentation Format: Oral

Since at least the Industrial Revolution, cities across much of the world have been designed to do specific sorts of things. Many incorporate skyscrapers- a recent spectacular manifestation of monumentality -and most seek to encourage the movement of people (since the Twentieth century via automobiles) and the consumption and flows of commodities. One thing they tend not to do is educate regular attention to the 'natural' elements and surrounding landscapes that generated and continue to produce them, as urban geographers such as William Cronon (for Chicago) and Ari Kelman (for New Orleans) have noted.

Precolumbian cities in the Andes varied greatly according to environmental zones and cultural-historical context. The sprawling city

of Chan Chan on the north coast of Peru grew rapidly over several generations in one of the most arid environments on the globe, rapidly outstripping its water sources and generating massive irrigation, transvalley projects.

In this paper I focus on the center of Tiwanaku, located in the southern Lake Titicaca Basin of the south-central Andes in what is today Bolivia. It had proto-urban origins in what local archaeologists term its Late Formative phases, and by the Andean Middle Horizon had coalesced as a major urban center- the largest in the southern portion of the Andes- of perhaps 6 km². Tiwanaku incorporated clusters of monumental campuses that drew vast numbers of people to the center for important ritual events attuned to calendrical cycles built into those very Monuments. Tiwanaku's ongoing construction demanded continual supplies of water, soil, and stone, all of which derived from landforms- in particular dramatic mountain peaks -that were considered animate and influential in human lives. Tiwanaku as a collectivity of constructed alignments, buildings, human movements, and visual paths, rendered the sources of its material production vital, potent, and central to its ongoing urban project.

04 IRRATIONAL URBANISM: GARDEN VARIETY ALTERNATIVES TO SUSTAINABILITY IN AMAZONIA

Author(s): Isendahl, Christian (University of Gothenburg) - Heckenberger, Michael (University of Florida at Gainesville)

Presentation Format: Oral

What is pre-Industrial urbanism that it matters to Amazonia today or in the future? For many it matters very little, if at all: there wasn't pre-modern indigenous urbanism. However, what happened in the Amazon before Europeans does fit one alternative model of urbanism, proposed by Ebenezer Howard's Garden Cities of Tomorrow (1902), the father of urban sustainability, the garden city green movement. The inspiration for the idea of tropical garden cities came indirectly, working on an archaeology of urban landscapes in São Paulo (2006-2007), starting in the neighborhood of Jardins, designed about that time (ca. 1900) and informed by the garden city model. The revelation was how closely aspects of the model fit pre-Columbian Amazonia: hyper-planned, organized and fixed networks of towns and villages organized in galactic clusters and the folding of architecture, production areas and nature into the urbanized built environment. Had Howard known of them, the Xingu galactic clusters would have merited a chapter: tropical garden cities of yesterday. Pre-Industrial urbanism was highly variable across the globe, but forest civilizations, particularly tropical forests, are very different than "oasis" cities, more diffuse, networked and, in Amazonia where stone, brick and metal were all but absent, woven in forested built environments sublime in their complexity. Their endurance over several centuries, from 1250 to after 1500 CE, suggests sustainable resource management, including promoting forest resilience. Like urbanism, defining sustainability turns out to be difficult, less a destination, a mark or term that one envisions ahead of time, but a journey of familiarization and contextualizing things in place, historically and socially, whether it be in the Xingu or São Paulo, revealing other readings of world, a science of the concrete. This paper explores these ideas through points (MH) and reflections (CI) to consider how alternative conceptions of urbanism matter to sustainable futures.

05 RECONSIDERING IRON AGE URBANISM: TOWARDS AN AGRO-URBAN MODEL?

Author(s): Moore, Tom (Durham University, Department of Archaeology) - Fernandez-Gotz, Manuel (University of Edinburgh)

Presentation Format: Oral

One of the main characteristics of Iron Age agglomerations is their low-density occupation, which includes large open spaces within the enclosed areas. Among the manifold roles of these 'empty spaces' we can name serving as places of assembly and/or refuge for the population of a wide rural environment, keeping livestock and agricultural production. Rather than considering these layouts as a reflection of unfinished projects, we should regard them as an integral part of the functions of large central places within an agro-urban model. The fact that in many agglomerations the basic settlement units continued to be enclosed farmsteads suggests a transfer of rural settlement patterns to more confined areas. This 'translocated landscapes' with clustered habitations units are the manifestation of social systems that emphasised the autonomy of households and lineages despite the centralising attempts related to the emergence of early urban centres. In this sense, the retention of the farmstead compound appears to represent the continued significance of the household as the pre-eminent locus of power and decision-making. Despite the development of increasingly hierarchical and centralised forms of power, the societies among which Fürstensitze and oppida emerged are likely to have maintained some heterarchical levelling mechanisms, such as forms of potlatch or the historically documented popular assemblies. These negotiated power structures may explain the layout of some agglomerations where internal compounds appear to retain 'rural' settlement forms.

06 MULTI-CENTRED TOWNS OF SUB-SAHARAN AFRICA

Author(s): Baumanova, Monika (University of West Bohemia; Uppsala University))

Presentation Format: Oral

The speed and scale of present-day urban growth has among other things significant impact on how people use and experience space. These aspects of urbanism contribute to the social environment and by extension, sustainability of urban society. Human sensory perception affects the way people construct their social environment and vice versa. It also influences the structures of social transactions and understanding the specific "atmosphere" of public spaces and buildings within towns as suitable for certain kind of interactions, events and behaviour.

This paper aims to contribute to the discussion on socio-spatial sustainability of urban growth, by providing examples from East and West sub-Saharan Africa. In the presented case-studies, I focus on how spatial dimensions of urban growth in centres which

display spatial plurality, demonstrated by the presence of multiple cores of urban settlements. This paper aims to highlight the role of urban form in trading towns that grew in African coastal regions, including the Swahili coast and the West African Sahel ('coast' of the Sahara).

In my research I have analysed the layout of urban centres in these regions from a comparative perspective, considering the organisation of public spaces, street networks and the inter-/intra-connectivity of urban quarters, which have developed organically over centuries. Historical evidence shows how these multiple cores represented by urban quarters functioned in a continually evolving state of balanced cooperation and competition. I will demonstrate, how analysing space as material culture from an archaeological point of view can help us today to acknowledge how such social relationships were constituted spatially and to advance our understanding of causalities in present-day urban growth.

07 RESOURCE LANDSCAPES AND CHANGING PRIORITIES: EARLY TOWNS ON ZANZIBAR

Author(s): Wynne-Jones, Stephanie (University of York) - Sulas, Federica (Aarhus University) - Fitton, Tom (University of York)

Presentation Format: Oral

Urban centres on Zanzibar are some of the earliest and most enigmatic towns in eastern Africa. Although they seem to have been sited to take advantage of international trade networks, and there is evidence that they were connected around the Indian Ocean by the 7th century CE, we know surprisingly little about how they functioned. Only recently have excavations begun to target the spatial layout of early towns, or to explore what activities occurred inside and outside the houses.

This is crucial information, as there is evidence that urban centres on Zanzibar occupied very different environmental niches, and archaeology can inform on sustainable practice in the past. This paper reports on research that is exploring the resource landscapes in which these early towns existed. Excavations and geophysical survey at Unguja Ukuu have focused on the spatial layout of the site, and on the use of local resources – crops, animals, forests, coral reef – in the maintenance of urban life. The fieldwork has recovered a series of different adaptations, probably based on different cultural decisions and technologies, suggesting that context is all important in understanding the working of a town and that past inhabitants developed different forms of sustainable urbanism to suit different times.

08 RISK AND RESILIENCE IN LONG TERM PROCESSES OF URBANISATION IN SOUTHERN AFRICA - IMPLICATIONS FOR THE FUTURE

Author(s): Sinclair, Paul (Uppsala University)

Presentation Format: Oral

In Nature Comment March 2015, Johan Rockström and Malin Falkenmark take up the implications of a doubling of population in Sub-Saharan Africa by 2050 with a predicted total of 2 billion people or 25% of the world population. They point to the region's dependency on rurally based rain-fed agriculture and the need to double agricultural production. Current global changes affecting this and other regions make the regularity and amount of rain in the medium and long term unpredictable. The very rapid pace of urbanization with attendant concerns of urban food security add further to the urgency of the situation (Sinclair et al 2010). New approaches need to be taken to adequately address these challenges, approaches which take human agency past, present and future into account. This presentation analyses the long term trajectories of urban development in southern Africa over the last thousand years in relation to changes in temperature and precipitation. Results of multi agent based modelling of settlements on the Zimbabwe plateau in relation to soils and changing agroecological zones are used to identify risks and vulnerabilities of present day and future urban centres and provide a context for policy support for urban planning and the transition to low carbon economies.

09 WAS GREAT ZIMBABWE'S MONUMENTAL PROJECT SUSTAINABLE?

Author(s): Pikirayi, Innocent (University of Pretoria)

Presentation Format: Oral

A very often neglected archaeological feature at Great Zimbabwe are the 'dhaka' pits or depressions, apparently quarried for earth, used for constructing houses on site. However, when examined in the context of the ancient city's urban and broader cultural landscape, these present new opportunities to see how Great Zimbabwe coped with growing urbanisation. Given its granite geological setting, a semi-arid, limited micro-watershed, and, water-stressed location, water was vital for the siting and continued existence of Great Zimbabwe. The advent of kingship initiated significant social complexity and precipitated major architectural investments. The ancient city's total transformation of the built environment through exploiting the granite rock within its immediate and broader landscape certainly placed considerable demands on its growth, triggering large-scale management of water resources. Management of water beyond domestic needs implied inward populations movement into the settlement, which had transformed into a massive resource-concentrating hub due to the building activity. The 'dhaka pits', were transformed into water storage facilities or reservoirs, similar to the micro-watershed adaptation done by the Maya, which coincided with the practicing of raised field agriculture in swampy margins. For Great Zimbabwe, open low-lying spaces outside the stone-built living residences were enhanced by the construction of 'perimeter' walling, and deepening spots on their flanks to stem the movement of flowing water. This would permit the predictable availability of water year round. This partially engineered landscape required considerable maintenance, though organized in a relatively passive manner. Runoff and spring flow springs were channeled into these depressions. But, how sustainable

was this?

10 RE-IMAGINING AN ANCIENT PORT CITY – SIGNATURES OF TRANSOCEANIC TRADE, TECHNOLOGY AND URBANISATION (300 BCE - 500 CE)

Author(s): PJ, Cherian (PAMA Institute for the Advancement of Trans-disciplinary Archaeological Science)

Presentation Format: Oral

Pattanam archaeological site (10°09.434'N; 76°12.587'E) on the south-western coast of the Indian subcontinent unearthed, (2007-'15) a plethora of archaeological evidence exposing the trans-oceanic links of the legendary port of Muziris (1st c BCE – 4th c CE). The evidences are critical to understand the early-historic urbanization processes fueled by trade network and technological advances. In the mature Iron Age phase, (1000 BCE – 300 BCE) with no evidentially supported antecedents of planned life or organized exchange systems, Pattanam transformed into the “first trade emporium” having interconnections with numerous cultures from the Gibraltar to South China; 15 centuries before Vasco da Gama reached the Indian shores or Columbus reached America. The count of early historic Mediterranean pottery at Pattanam is the highest ever from an Indian Ocean port site.

The evidences carry characteristics beyond the “Urban Revolution” discourse since Gordon Childe to suggest the 2nd phase of Urban Revolution in human history. The most conspicuous seems to be the interconnectedness, cultural plurality and sublimity of life as revealed through the Pattanam material evidence and classical Greek, Latin and Tamil textual sources. The ancient DNA studies on 11 human bone samples underline the multi-cultural character embedded in the early urbanization process. The structural features different from the contemporary Roman imperial models, reflect, affinity to human-scale-dimensions as a visible feature of urbanization at Pattanam site. The relative absence of organized religions poses the question; was it due to the nature and influence of Jain and Buddhist thought-systems, often argued as non-violent, less exploitative trade ideology of the times?

The paper proposes, the shared human oneness, as probably, foundational to the origin and sustenance of early trans-oceanic exchanges and urbanization processes.

11 SUSTAINABILITY, RESILIENCE AND SYSTEMIC OBSOLESCENCE: TROPICAL LOW-DENSITY URBAN COLLAPSE IN SRI LANKA

Author(s): Strickland, Keir M. (La Trobe University)

Presentation Format: Oral

The Anuradhapura Kingdom emerged from Sri Lanka's northern plains as the island's first complex, urban, state in the Early Historic period. The polity, centred upon its low-density urban capital of the same name, rapidly developed into a major Indian Ocean hub despite the semi-arid marginal environment of the island's northern plains. Indeed, this environment contributed to a distinctive tropical low-density urban form (Lucero et al. 2015) in which a monumental and complex hydraulic landscape facilitated an economic structure that saw Buddhist monastic institutions performing the administrative roles typically associated with higher-order settlements, while Anuradhapura's settlement was typically small-scale, short-lived, and mobile.

This system endured, flourished even, for almost 1500 years, before apparently “collapsing” in the 11th century CE. This collapse, described by Sri Lanka's great Pali chronicles, has traditionally been ascribed to invasion by the South Indian Chola Empire.

This paper presents an archaeological reassessment of that apparent 11th century collapse, with specific reference to the characteristic tropical low-density urban form of Anuradhapura, and argues that the abandonment of Anuradhapura (both urban and rural) was a deliberate decision after Anuradhapura entered a state of economic crystallisation and declining marginal returns. Moreover, this paper argues that that this failure of Anuradhapura's complex and highly specialised economic system, was effectively a form of systemic obsolescence.

12 URBAN NETWORKS: ROBUSTNESS AND VULNERABILITY

Author(s): Fletcher, Roland (University of Sydney)

Presentation Format: Oral

From a European, West Asian, Indian and Chinese compact urban perspective, continuity in urban networks is not in issue. Towns and cities may come and go, but are readily replaced and the networks of which they are part remain in place and transmute gradually. Even in marginal Roman Britain, though small towns often faded away, major nodes of the urban network remained in place and still thrive today. From this perspective urban networks, once established, may change in detail, but have become a permanent feature of the landscape. This may incline us to regard this as a normal condition of any urban network, including the ones we are now developing with giant dispersed, low-density megalopoli or desakota as their nodes. The archaeological record may suggest otherwise. Human communities have lived in low-density cities prior to industrialisation and created urban networks around them, in Mesoamerica, Sri Lanka and SE Asia. The Classic Maya cities and Angkor are iconic examples. But no large, agrarian-based, low-density city persisted beyond the 16th century CE, creating the impression that low-density urbanism was a new phenomenon deriving from industrialization and can be understood and managed without attention to the past. But the story of the great pre-modern low-density cities does not suggest that a presentist self-absorption is wise. Not only did no major, low-density city survive the aggregate temperature increase and decrease associated with the start and the end of the Medieval Warm Phase, neither did their urban networks. Low-density urban networks may last a long time, but the demise of their major nodes appears to take apart the associated

network. This may, perhaps, be of some significance for our present and our future.

13 THE MEGA-URBAN REGION AND THE ANTHROPOCENE: A LONG TERM VIEW OF URBAN ECOSYSTEMS AND URBAN SUSTAINABILITY IN ASIA

Author(s): Hawken, Scott (University of New South Wales)

Presentation Format: Oral

This paper traces advances in theory, analytics and mapping within different knowledge domains and disciplines and integrates the findings to consider implications for today's mega-urban regions.

Many of Asia's emerging urban territories are located within semi-aquatic agricultural ecosystems including those of the Yangze, the Pearl River, the Irrawaddy, the Chao Phraya, the Red River, and the Mekong. Preindustrial societies comprehensively altered extensive areas of these delta and semi-aquatic landscapes to form artificial wetlands suitable for the cultivation of rice. The agricultural wealth created from these regions formed the economic foundations of powerful preindustrial societies. In strategic locations these artificial ecosystems also formed the foundations of massive urban settlements such as Angkor, in Cambodia. The urban development of preindustrial rice ecologies has important implications for the biodiversity, water quality, agriculture, quality of life, and the conservation of cultural and environmental heritage.

In recent years new theoretical and empirical analytic and mapping techniques have provided new insights into Asia's urban regions both past and present. These have occurred within different disciplinary areas and knowledge domains. This paper reviews data and theoretical advances across four different domains: 1. Archaeology, 2. Ecology, 3. Urban Planning and 4. Geography. Each interprets the Anthropocene in different ways with different scales of spatial and temporal resolution and range. A series of original detailed maps relate data from the four domains providing insight into the evolution and degree of transformation of such systems emphasizing that predominant limited scales of urban analysis need to be transcended to better understand long term sustainability and resilience.

266 PUBLIC PARTICIPATION IN EUROPEAN ARCHAEOLOGY: THE LEGAL FRAMEWORK

Theme: Archaeology and the European Year of Cultural Heritage

Organisers: Benetti, Francesca (University of Padua) - Almansa Sánchez, Jaime (Incipit CSIC)

Format: Discussion session

Public participation has been a key topic in archaeological debates, as well as in the daily management of archaeological sites, during the last decades. The important role of public participation in the whole heritage sector has also been witnessed by international documents, such as the Faro Convention (2005), and recent European policies (e.g. Council conclusions on participatory governance of cultural heritage: 2014/C 463/01). However, when dealing with public participation in the different European States, archaeologists have to deal primarily with national legislation. The characteristics of these laws can foster or challenge public involvement, both in researching and in managing archaeology. For example, national policies and schemes can facilitate procedures for public involvement, or set specific boundaries for letting non-professionals participate. Far from standardizing practice, the legal frameworks across Europe are setting opposite standards that make it difficult to work in cross-national projects.

This round table will explore the legal framework of public participation in archaeology across Europe, addressing in particular: (1) the implementation of the European Conventions in the States that ratified them (e.g. the implementation of the Faro Convention in the archaeological context, or the relationship between the conflicting views of the Valletta and the Faro Conventions); (2) the national laws, regulations and policies, evaluating challenges and best practices of public involvement throughout Europe; (3) the challenges emerging from such a heterogeneous scene and how to face them.

Although this session is focused on European archaeology, examples from other regions are welcome.

ABSTRACTS

01 LOOK BUT DON'T TOUCH! YES, WHATEVER...

Author(s): Almansa-Sanchez, Jaime (Incipit, CSIC)

Presentation Format: Oral

European regulations have helped to change the shape of archaeology in many ways. Faro Convention put on the table a radical proposal that might be difficult to implement in many countries due to conflicts with other regulations. However, what do we understand as participation? How can it be encouraged in certain circumstances? Does it even matter? A critical approach to this matter is needed.

While many countries have not ratified this Convention and currently have very restrictive—or limited—regulations in respect with

public participation in archaeological practice, reality is not always as strict as the law, opening ways to allow participation.

This paper will: 1) critically analyse the concept of participation; 2) question current models of practice and their legal basis; and 3) propose an alternative to these frame regulations from a critical practice. After all, we do not need the law to dictate our actions and we are already doing as we please.

And as I need to write a minimum of 200 words, I am starting to think there is a good way to enforce regulations... by putting a machine behind and make us do everything as it is set. Do you like this scenario? I do not, for sure...

02 PUBLIC PARTICIPATION AND ARCHAEOLOGICAL TRAINING

Author(s): Masriera-Esquerri, Clara - González-Marcén, Paloma (Universitat Autònoma de Barcelona)

Presentation Format: Oral

From the perspective of archaeological initial and long-life training

The tension between the conservationist and professionalizing principles of the Valletta Convention and the proposal of the Faro Convention that promotes a leading role of the communities in the establishment of criteria and decision-making on cultural (and therefore, archaeological) heritage, is especially pronounced in the framework of initial training in archaeology. How should be defined the ultimate aim of archaeology and archaeological research? Which should be the priorities of archaeology professionals? By the same token, in long life training, there is a similar contradiction, since the content and recommendations of the Faro Convention seem to contravene a consolidated professional and administrative practice in most European countries.

However, the archaeological academic system has not produced yet a response to the challenge of how to deal with this apparent dichotomy, neither has it produced a grounded reflection on how to incorporate a critical discussion about legislative precepts and boundaries of the normative social role of archaeology in its training schemes.

To show these conceptual and training difficulties, several examples will be presented stemming from the initial formation in several European countries, as well as from training programs carried out within the framework of the public administration of the archaeological and cultural heritage in Spain.

03 PUBLIC PARTICIPATION IN THE MANAGEMENT AND CONSERVATION OF SIERRA NEVADA CULTURAL LANDSCAPE (SPAIN)

Author(s): Delgado Anés, Lara (University of Granada)

Presentation Format: Oral

The broadening of the heritage concept and the inclusion of landscapes has generated the need for new legal and management tools of great complexity, and that have not always solved well the problems related its conservation and protection. The landscape as a heritage is a complex element, it represents the relations between the society and the nature and it affects different regulatory frameworks.

For the management of the Cultural Landscape is important the participation of the local communities, for their close fixation and personal relation with the territory in which they inhabit. These landscapes are associated with family histories and memories.

We must bear in mind that the public is multivocal and different in their attitudes, interests and perceptions, so that decisions should not be made without them. As professionals we must analyse these spaces but without losing the attention to the groups that inhabit it or that are users or have some connection with the place.

The fact that the legal documents tend to naturalization and do not recognize that these are anthropized landscapes and inhabited, causes a greater difficulty for the proposals of co-governance or participatory management.

Focusing attention on the participation of the local community we find few references in the national and regional normative, and it is also about recent documents.

We will see the main documents in Spain in order to address questions how its address the management of cultural landscapes, how its affects to local communities, how traditional practices are regulated, which documents facilitate the participation of communities: environmental or territorial documents. These questions are fundamental to understand possibilities and limits of citizen participation in its protection and management. We will see also some examples of good practices about the participation in Cultural Landscapes.

04 PROTECTING HERITAGE: FOR THE PUBLIC OR FROM THE PUBLIC? THE GERMAN CASE

Author(s): Moeller, Katharina (Bangor University)

Presentation Format: Oral

On 27 October 2005 the Council of Europe issued the Framework Convention on the Value of Cultural Heritage for Society, widely known as the "Faro Convention". This document recognises that engaging with cultural heritage is an important aspect of participating in cultural life, a right, which is already protected in the United Nations Universal Declaration of Human Rights (1948). Article 4a of the Faro-Convention states that "everyone, alone or collectively, has the right to benefit from the cultural heritage and to contribute towards its enrichment". This emphasises the importance of public participation in archaeology.

In Germany, cultural matters are the responsibility of the individual federal states. As a result, there are 16 heritage laws; one for each state. One criterion all of them use to define heritage worthy of protection is that its preservation must be in the interest of the public. If we are, in fact, protecting heritage for the public, surely public participation should be encouraged? After all, what is the point in protecting something for the public, if the public cannot use these resources?

This paper uses the rights outlined in the Faro Convention as a basis to analyse the German heritage laws in terms of the level of public participation possible in Germany under the current laws.

05 PARTICIPATORY ARCHAEOLOGICAL RESEARCH IN CROATIA: BETWEEN LAWS AND PRACTICE

Author(s): Rizner, Mia (Università di Padova, Dipartimento dei beni culturali)

Presentation Format: Oral

The communication will present the state of participatory research in Croatia mainly in regard to legislation. The Republic of Croatia has national legislation pertained to heritage protection which encompass archaeology and archaeological research. These are, as the most important Croatian Heritage Act which covers heritage in general and tackles archaeology and archaeological research only fundamentally as part of heritage, and Archaeological Research Rule which covers specifically archaeological research. None of these legal acts mention participatory research which indicates its legal status. Nonetheless, participatory research in Croatia is present. Croatia has also ratified international conventions pertaining to the subject of participatory research and archaeology (Faro convention and La Valetta convention respectively). Although being ratified, the extent at which these international conventions are incorporated in national legislative and its influence on the field research is discussed. Another aim of this communication is to describe in what manner and at what extent the legislation tackle participatory research in archaeology, what are the responsibilities of involved parties, the scale of allowed participation in regard to complexity of the site and the role of supervisory state agencies in participatory research will be tackled. Therefore, the communication offers analyses of current state of participatory research in Croatia by observing the clash between its legal and practical aspect. Several case studies will be presented from a view point of an archaeologist working at the conservation department which is a supervisory state agency responsible for heritage.

06 PUBLIC PARTICIPATION IN AUSTRIA: PROMOTED, PERMITTED, OR PROHIBITED?

Author(s): Karl, Raimund (School of History, Welsh History and Archaeology)

Presentation Format: Oral

In 1978, Austria ratified the International Covenant on Economic, Social and Cultural Rights, which in its Article 15, establishes the right to participate in cultural life and academic freedom as fundamental human and civil rights.

In the following three decades, Austria considerably tightened its archaeological heritage legislation. In 1978, a permit for fieldwork was only required on scheduled monuments or if one wished to be exempt from the duty to pause works if finds had been made. In 1990 and 1999, the possibility to be granted a permit was first restricted to persons who had proven their archaeological competence, and then to archaeology graduates only. Since 2010, by issuing – incidentally mostly unlawful – guidelines, the National Heritage Agency (BDA) further restricted the conditions for permitted archaeological fieldwork: it now is only possible where, how, and by who the BDA wants it to be done; in effect prohibiting completely any participatory approach to archaeological fieldwork.

Yet, by ratifying the Faro Convention in 2015, Austria recommitted itself to an even more explicitly participatory approach to archaeology and other cultural heritage-related research; yet without any implementation in practice. For interested parties, this creates an unsolvable conundrum: is the Republic committed to promoting public participation in archaeology, does it only permit it under very specific circumstances, or does it prohibit it completely?

In this contribution, I will thus raise the question: is it time for the state to make up its mind? Or are firm commitments under International Law not worth the paper they have been printed upon if the state's agency tasked with enforcing the law simply decides to disregard them?

07 BETWEEN VALLETTA AND FARO: CHALLENGES IN PUBLIC PARTICIPATION TO ARCHAEOLOGY IN ITALY

Author(s): Benetti, Francesca (University of Padua)

Presentation Format: Oral

Archaeology in Italy is by large State-driven, as cultural heritage is considered a matter of public interest. It is regulated by the Code for Cultural Heritage and Landscape (2004), which – between other provisions – states that “archaeological researches” are reserved to the Italian Ministry of cultural heritage (art. 88). Despite some critiques to this provision as contrary to Italian Constitution (art. 33, “art and science are free as it is their teaching”), this article is still valid. If other subjects (both Italian and foreign) want to carry out excavations in Italy, they have to ask for a special permission, called “concession”. In 2015 Italy ratified the Valletta Convention (law 57/2015) and the same year the General Director for Archaeology (one of the central offices of the Ministry) issued a circular which prohibited the participation of volunteers to the excavations under concession, justifying the measure by saying that only professionals can guarantee the quality of the research. This paper discusses and challenges this provision, comparing this interpretation of the Valletta Convention with other European countries. Furthermore, it is now under discussion in the Italian Parliament the ratification of the Faro Convention. The paper will also underline the possible conflicts between the Italian interpretation of the Valletta Convention and the ratification of the Faro Convention.

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Bartelheim, Martin (Universität Tübingen) - García Sanjuán, Leonardo (Universidad de Sevilla) - Hardenberg, Roland (Universität Frankfurt) - Salanova, Laure (CNRS - Institut des Sciences humaines et sociales)

Format: Regular session

Cultural landscapes bear traces of the use of resources over long periods. These reflect not only ways of using, shaping, organising, controlling and exchanging resources, but also knowledge, perceptions, motivations for actions and related social dynamics. Resources can be material as well as immaterial and constitute the basis for the development and decline of societies. They are usually not exploited in isolation, but as parts of complexes whose specific constellation in time and space can be best described as assemblages.

In this session we intend to debate new concepts of the interrelation of social dynamics and resource use and to discuss case studies in which landscapes were shaped to facilitate the utilisation of resources. The identification of what has been considered to be a resource will be discussed as well as the means through which the corresponding landscapes were transformed and the results. This implies not only material, but also spiritual aspects.

In general we would like to explore aspects like:

- Can we detect a conscious human formation of landscapes in order to suit the exploitation of resources?
- How are landscapes created to serve the needs of resource use? What are the social practices connected to this?
- Is there specific evidence for a personal or group identification with resources/resource use and which ideas and values are linked with these identities?
- Which perceptions of resources and landscapes as well as motivations for action can be traced?
- How are socio-cultural dynamics linked to the use of resources?

ABSTRACTS

01 DWELLING IN AN INDIAN RAINFOREST: SLASH-AND-BURN CULTIVATION AS MODE OF LIVING

Author(s): Hardenberg, Roland (Goethe University Frankfurt)

Presentation Format: Oral

The highlands of Central India are in some parts still densely covered with forests and inhabited by different indigenous communities. One of these "tribes" are the Dongria Kond, who live in villages located in the Niamgiri mountain range of southern Odisha. They perceive of their environment as populated by various spirits and gods with whom they have to entertain good relationships in order to survive. The whole process of growing crops requires not only agricultural labour but a continuous dialog with the forces inhabiting this environment. This is accomplished with the help of shamans who perform various rituals in order to establish a link between humans, plants, animals and the powerful forces that also inhabit this environment. Slash-and-burn cultivation is therefore not simply an agricultural activity but a form of dwelling: it implies interactions with various agents and a continuous awareness of the consequences of one's own actions on this environmental network. The production of crops on the fields is therefore not simply an aspect of local economy, but a mode of living that includes humans as well as non-humans. This case study shows that from such a perspective resources such as crops are not simply "produced" as in modern society, but "protected", "raised", "hunted", "shared", "transmitted" or "exchanged". This may offer an example to archeologists for discussing popular ideas of "economic production" in pre-historic times.

02 LANDSCAPE SPHERES: NETWORKS, BOUNDARIES AND CONSTRAINTS

Author(s): Kempf, Michael (University Freiburg)

Presentation Format: Oral

Contemporary landscapes seem to be a copy of past landscapes. That of course demands the imagination, idea and concept of certain landscapes with therein interacting individuals resulting in a remodelling of nature. That includes the hypothesis that landscapes are built not only by human intervention but also by human experience. The 'cognitive maps' or 'systems of spatial knowledge' define a certain space of socio-cultural interest interacting in a certain area. Those maps might generate a mental topography of experiences – creating across-generation narratives of landscapes. In other words, landscape functions as image carrier of individual or group identity. The attempt to model perception of landscape becomes more and more prominent in multidisciplinary research projects focussing on human mobility and environmental archaeology. Though archaeological material and human spheres are neither acting on the same scale nor are they usually congruent. Human mobility is traditionally characterized by the exchange of goods. Though it is not clear if it is the material that is negotiated or the individual himself is mobile. In this context, the surrounding landscape is the ordering body of the individual spheric extent. Though to what amount is it possible to model the mental construction of space and landscape? This paper argues with the possibility to differentiate landscape in physical and cognitive categories. Examples from

spatial modelling and environmental analysis will be cited to discuss the uncertainties of modelling human interactions in landscape.

03 UPLAND PLATEAUS. MOUNTAINOUS AGRICULTURAL LANDSCAPES AS ARKS OF NATURAL AND CULTURAL HERITAGE IN GREECE

Author(s): Simoni, Eleni (Department of Geology, University of Patras) - Papagiannopoulos, Konstantinos (Institute of Local history) - Tsiakiris, Rigas (Department of Forest Administration and Management, Forestry Service of Ioannina) - Stara, Kalliopi (Laboratory of Ecology, Department of Biological Applications and Technology, University of Ioannina)

Presentation Format: Oral

Due to tectonic and erosional activities in recent geological years, Greek landscape is adorned with a dynamic relief ranging from gently undulating to rugged slopes of the high mountain zone, only few kilometres far from the coast. Especially in limestone substratum, numerous upland plateaus (named "polje" if small) have been formed between the mountains of the mainland. Since antiquity, they have functioned as containers and generators of abundant and diverse natural and cultural, tangible and intangible resources, and have contributed essentially to the formation of a local identity built on the slopes or along the roads that humans have constructed.

This paper presents the cultural landscape evolution of two distant mountain plateaus, by exploring the effect of management practices which local communities used to regulate social and economic needs. Data are drawn from interdisciplinary research in the Soudena polje of Zagori (NW Greece) and in the Soudena polje of Kalavryta (SW Greece), stimulated by oral traditions of their inhabitants that they share a common identity, based on the belief that the latter was colonized by "Soudeniototes" of Zagori who fled south during the Ottoman occupation.

We have found analogous patterns of ancient and modern time trajectories of landscape use. Villages located in the edges of the plateaus, scattered sanctuaries, dry-stone walls, cobblestone-paved roads, wells, threshing floors, handmade drainage canals and non intensive agriculture are living remarks of a relict cultural landscape, however still in use. Recent population exodus, part rearrangement of the most productive land, removal of fences and isolated veteran trees, transition of farmland to pastureland and encroachment of vegetation in the rough surrounding slopes are similar modern transformations. Both areas are now included in National Parks and the UNESCO Global Geoparks characterized mainly by their famous rough gorges, but mountain plateaus may hide more interesting bio-cultural secrets.

04 ABANDONED VILLAGES. AN ARCHAEOLOGICAL APPROACH TO STUDY THE SOCIAL AND LANDSCAPE TRANSFORMATIONS IN THE PYRENEES.

Author(s): Jané, Oscar (Autonomous University of Barcelona) - Gascón, Carles (UNED) - Vergés, Oliver (Autonomous University of Barcelona) - Guàrdia, Carlos (University of Barcelona)

Presentation Format: Oral

The peninsular territory has a huge number of abandoned and uninhabited villages for reasons often related to economic reasons. The Pyrenees has been a space of big migratory currents since the nineteenth century. As a border territory, its inhabitants take advantage of the proximity of France and begin a trip for a job that, over time, stabilizes to become a definitive emigration. This involves the emptying of many Pyrenean villages. Indeed it is necessary to focus on the effects of the Spanish Civil War from which two or three new migratory waves begin: the exiled ones of the war; The movements due to the proximity of the border and the effects of the guerrillas and the Francoist repression during the post-war period; And a last wave during the 1960s, linked to economic reasons.

At this regard, the role of archeology is fundamental. The large number of abandoned or semi-inhabited peoples have kept intact many signs of life of the 20th century and earlier centuries. His study offers several opportunities, such as: the archaeological study itself and the observation of the reverse process of the collapse of a site; the analysis of the real reasons for abandonment, such as economic shortcomings or economic and social repression; understand the social and political networks in the Pyrenees; The transformations of the landscape linked to the abandonment of the villages. All this requires an archeological and historical research in order to know that, as we can observe by the first signs, many such decisions were planned and not involuntary.

Thus the Pyrenees become an open deposit area with the multiplicity of abandoned villages. All in all, the systematic study of abandoned villages in the central and western Catalan Pyrenees can provide data on the real effects of economics, politics, social behaviors and ideologies during the 20th century.

05 NORMAN SICILY, A STUDY CASE OF HUMAN-MADE LANDSCAPE FOR RESOURCES ASSEMBLAGE

Author(s): Vaquero, Pablo - Martín Civantos, José María (University of Granada) - Corselli, Rocco (Arqueoandalusi. Arqueología y Patrimonio SL)

Presentation Format: Oral

The Norman conquest of Sicily introduce not only new rulers and ways of government, but a new way of relating humankind and nature. Even when Arabic traditions -which demonstrate a highly resilience capacity- were maintained, distinct ways of obtaining resources were introduced. The aforesaid process created a different landscape from previous times. However, there are still some inquires to be answered, such as the real conformation of that landscape, or the determination of when was the feudal system introduced in the island and the changes that it supposed to the environment. Thus, the real usage of nature for assembling resources

during the Norman period and beyond remains almost as an enigma. This paper, fruit of an initiation research grant at University of Granada and within FP-7 MEMOLA Project, therefore, seeks to answer these questions: Firstly, it will be seen what impact had the Norman conquest of Sicily in the landscape. Secondly, it will be tried to detect, if it is possible, a conscious human formation of landscapes to suit the exploitation of resources under Norman rule. Thirdly, determine whether there is a relation between resources gathering and settlements or there was not interrelation between these factors (human settlements and nature). Subsequently, it is going to be determine when the feudalisation took place in Sicily. Finally, we seek to recuperate traditional knowledge from rural communities in relation with assembling strategies which can be traced back to the focused period, if not earlier. In the end, the final question that we seek to answer is how socio-cultural dynamics (Norman conquest and rule, and feudalisation) linked to the use natural of resources.

06 DIVIDING AND ENCLOSING THE LAND: RESOURCE MANAGEMENT IN PREHISTORIC SHETLAND

Author(s): Christie, Claire (University of Aberdeen)

Presentation Format: Oral

The rarely paralleled preservation of extensive prehistoric houses, field systems and burial monuments in the West Mainland of Shetland affords unique opportunities for understanding prehistoric landscape management. The remains, preserved by the spread of peat and the lack of subsequent intensive plough-based agriculture, are widely considered to date from the Neolithic - Bronze Age. Despite their impressive preservation, the remains on Shetland have received comparatively little archaeological attention. This paper presents the results of a programme of mapping, using high-resolution aerial photographs, that explores the extent and spatial distribution of upstanding prehistoric remains within the landscape of the West Mainland. The mapping was complemented by the excavation of one such settlement site which revealed a complex sequence of remodelling and reuse. Previous investigations of these Neolithic/Bronze Age landscapes are characterised by conformity to a paradigm of orderly agricultural plots and settlements. However, the results of this new programme of mapping and excavation revealed striking levels of variation and development within the landscape suggestive of different resource exploitation. It is far from clear that there is development from simple to complex field systems (as has been assumed and suggested previously in Shetland), and this has implications for how we view prehistoric resource management. The unique preservation of landscapes in Shetland also allows for an exploration of how these prehistoric remains became a valuable resource themselves in later periods, from the Bronze Age through to the present day.

07 THE CONSTRUCTION OF “CETINASCAPES” BETWEEN THE MEDITERRANEAN AND THE BALKANS AT THE END OF THE 3RD MILL. BC

Author(s): Gori, Maja (Ruhr University of Bochum)

Presentation Format: Oral

Resources and their appropriation represent an outstanding vehicle to describe transformations, especially if we consider them as socially produced constructions expressing what people perceive as relevant for their life. Resource-getting strategies and commerce connected to metallurgy are generally indicated as the main driving forces behind the expansion of the Cetina phenomenon, one of the large-scale ideologically-motivated interaction networks that characterised the 3rd mill. BC, and that connected the central Mediterranean to the western Balkans. However, the data at our disposal show that ideological and social aspects were equally important, since the Cetina phenomenon is also characterized by the spread of burial mounds in Dalmatia, which created a monumental landscape, by the long-distance mobilization of prestige objects with high symbolic value (e.g. bossed bone plaques, stone wrist-guards, etc.), which were perhaps transferred by gift exchange between distant communities, and by phenomena of technological and formal hybridisation in ceramic production and acculturation in practices connected to ritual and funerary spheres. This paper will explore the role of material and immaterial resources in the spread of Cetina features by means of both seaborne and overland mobility at the end of the 3rd mill. BC, and in the construction of materialized environments and different “Cetinascares” across the Mediterranean and the western Balkans.

08 WATER LANDSCAPES IN ANTEQUERA (SPAIN): EXPLORING THE ROLE OF WATER RESOURCES IN SETTLEMENT PATTERNS, MONUMENTALITY AND CONNECTIVITY

Author(s): García Sanjuán, Leonardo (Departamento de Prehistoria y Arqueología) - Montero Artús, Raquel (University of Sevilla)

Presentation Format: Oral

Water, a key factor for the survival of the human being, has always played a strategic role in defining the territory and landscape of any community. Since the Neolithic, sedentary communities needed to ensure a permanent supply of water, especially in arid or semi-arid regions, such as those that delimit the Mediterranean sea. In addition to guaranteeing human subsistence, the water element served prehistoric societies to obtain a series of associated resources. The most important of these may be salt, an exceptional basic resource used for the conservation of food and the maintenance of animals, and which acquired a particularly strategic value from the Neolithic onwards. Of course, there are aspects related to water that go beyond the tangible and that extend to the beliefs: thus, in many cases certain waters have been attributed special properties, among others, healing ones, with important social and cultural consequences. This paper explores the importance of water in the construction of resource landscapes, using as a case study the Late Prehistory of the Antequera region (Malaga, Spain), home to the Antequera dolmens site, included by UNESCO in the World Heritage List in July 2016. The hydrogeological richness of the Antequera region confers very different characteristics on

the waters of the area. This diversity includes both the very low mineralization waters that arise from the El Torcal limestone massif, as well as the hypersaline waters of the Fuente de Piedra lagoon, or the Guadalhorce River, which flows through the fertile Antequera plain on Triassic materials and Quaternary deposits. It is an environment densely occupied since the Neolithic, and includes an exceptional megalithic complex.

09 **DEFINING A LANDSCAPE – THE SOCIO-CULTURAL SIGNIFICANCE OF MAN-MADE AND NATURAL DEMARCATIONS IN AN EARLY IRON AGE LANDSCAPE**

Author(s): Hansen, Astrid (De Kulturhistoriske Museer i Holstebro Kommune)

Presentation Format: Oral

Several natural demarcations define the densely populated landscape around the river Storå, Denmark. This landscape is located at the very edge of the Weichselian ice sheet, thus creating a unique range of natural resources associated with both the clayey forehills to the north and the sandy river valley to the south. During the Bronze Age and early Iron Age these natural demarcations were supplemented by several hundred burial mounds, forming a line parallel to the river, and possibly linked to a main travel and transportation route, as well as four pit zone alignments, presumably associated with some form of regulation of access. Thus raising the question whether the features of the landscape itself determined its use by humans, or whether human use transformed the features of the landscape.

This particular landscape further poses an opportunity to determine the interrelation of social dynamics and resource use. I will do this by exploring questions such as who build the demarcations, and by trying to pinpoint which resources, (including, but not limited to raw materials, pasture, arable land, and access to important sites, such as burial grounds) were freely shared, and which were controlled by smaller social groups, i.e. a single farming community.

In this paper, I will give a preliminary overview of the evidence, and invite discussion on the wider implications of defining a prehistoric landscape. By analyzing the resource use within the landscape, as well as the demarcations around it, I wish to show the diversity of a complex landscape, which both form spatial occupation, and is formed by the inhabitants.

10 **TERRA SIGILLATA ITALICA PRODUCTION: SHAPING VASES AND LANDSCAPES**

Author(s): La Rosa, Lorenza (University of Oslo)

Presentation Format: Oral

During Roman late republic and early empire, some ceramic industries became increasingly mass-produced and diffused within and beyond the Roman world. The product symbol of this expanded market and organized production is undoubtedly terra sigillata, a red and glossy table ware manufactured in Italy since the second half of the 1st century BCE and then in other provinces such as Gaul and Germany. In my paper, I will describe the organization of the workshops in central Italy as part of the rural economy and therefore involved in a more comprehensive landscape management, including the use of resources, space, labour, and market infrastructures. In particular, through the combination of archaeological and paleoenvironmental data, I will contextualize the exploitation of vegetal resources as fuel for the kilns in the broader rural economy. Not only result of the cutting of forests, wood supply could be satisfied using agricultural waste, in a production cycle that we would today define "circular economy". Furthermore, the owners and managers of the workshops were the same gentes that owned the agricultural properties, element that illustrates again the close integration of agricultural and ceramic productions and had as a possible outcome the deployment of the labour force in different activities according to the needs. In this perspective in conclusion, I will discuss the opportunity to include the pottery production in the all-encompassing Roman land administration, regarding fields, forests, waterways and roads, shaping the landscape in several ways, among which the well-known centuriation grid constitutes only an important, but not exhaustive, fragment.

11 **GROWING RITUAL: PREHISTORIC GARDENS AND IMBUED LANDSCAPES**

Author(s): Carmody, Stephen (Troy University) - Hollenbach, Kandace (University of Tennessee)

Presentation Format: Oral

In the Eastern Woodlands of North America, the origin of initial plant domestication is well-documented. The plants involved were a suite of small seed crops commonly referred to as the Eastern Agricultural Complex, comprised of goosefoot (*Chenopodium berlandieri* ssp. *jonesianum*), sumpweed (*Iva annua* var. *macrocarpa*), pepo gourds (*Cucurbita pepo* spp. *ovifera*), sunflower (*Helianthus annuus* var. *macrocarpus*), maygrass (*Phalaris caroliniana*), knotweed (*Polygonum erectum*), little barley (*Hordeum pusillum*), and giant ragweed (*Ambrosia trifida*). Decisions made by hunter-gatherer groups that led to initial plant domestication established new relationships between prehistoric groups, peoples, and the natural world. These new relationships are correlated with panregional religious movements, the construction of monumental architecture, elaborate mortuary ceremonialism, and the ceremonially based acquisition and trade of exotic raw materials, that have come to define the Woodland (3,200 – 1,020 cal yr BP) period. Though the analysis of plant assemblages from across the region, we explore the role of gardens in the production and reproduction of the cultural, societal, and political worlds of the Woodland period gardeners who tended them, instead of for their caloric contributions. When viewed as rituals of foundation, gardens/gardening are reframed as locales and actions that are instrumental to groups and not just those directly involved.

12 RECONSTRUCTING MOBILITY AND LANDUSE PATTERNS IN NEOLITHIC AND COPPER AGE APULIA

Author(s): Becker, Valeska - Filloramo, Roberto (Westfälische Wilhelms-Universität Münster)

Presentation Format: Oral

The region of Apulia, southern Italy, is especially interesting during early Prehistory. Due to its fertile soils and its abundance of valuable raw materials, especially high-quality flint and obsidian sources off the coast, the density of settlements is very high from the earliest Neolithic onwards. In a selected area in this region, an ongoing project situated at the universities of Münster, Germany, and Bologna, Italy, and the Soprintendenza Archeologia, Belle Arti e Paesaggio per le province di Barletta-Andria-Trani e Foggia, Italy, is currently dealing with the comprehension of how prehistoric communities moved in their territory and how they exploited the landscape during the Neolithic and the Copper Age up to its transitional aspects. This area was chosen because the region played an important role as a bridge between the eastern Mediterranean Sea and the inner Peninsular areas during pre- and protohistoric times, thus permitting a mutual exchange of ideas, artifacts and people.

Since the landscape and human presence are linked via site distribution, the investigations will cross-reference the data through Social Network Analysis (SNA) in order to create a network of types of ties and relationships that connected these factors. This will be a fundamental aspect to comprehend how the ancient communities exploited the landscape, and to determine the reasons for site choices of settlement when they arrived, also in relation with local and foreign influences that began to emerge from the Neolithic onward. Hence, the research aims to introduce new ways to analyze the landscape in relation to human frequentation, combining the insights with further investigations such as a technical-stylistic analysis of artefacts.

13 SPECIALISED ACTIVITIES AND FRACTIONALISATION OF LANDS DURING THE LATE 3RD MILLENNIUM BC IN FRANCE

Author(s): Salanova, Laure (CNRS)

Presentation Format: Oral

The last three decades of archaeological discoveries in France have provided new bases for discussing the domestic sphere and the economy of the population from the late 3rd millennium BC (transition between the Neolithic and the Bronze Age). Environmental analyses indicated that this period coincided with a cooling of temperatures and an increased human pressure on landscape, more pronounced than previously noticed. Permanent settlements are not really known and many sites were left around the mid-3rd millennium BC. Instead human occupations were recorded in atypical emplacements, in flood and wet areas near the Atlantic littoral or continental riverbanks. These sites of short duration are generally well preserved, protected by fast dune formation or overflow layers of rivers. They delivered evidence of specialised activities, related to the necessary abundance of water (tannery) or the exploitation of aquatic resources.

The special features of these sites will be presented according to their regional distribution and discussed to analyse their position within a network of settlements with complementary economic activities. Although it is still difficult to reconstruct precisely territorial organisation, the overall vision of these data points to a fractionalisation of lands, which is not so different from the more visible forms identified at the same period in Southern Europe.

14 BURIAL ASSEMBLAGES VS RESOURCE ASSEMBLAGES: A LOOK INTO THE ECONOMIC BACKGROUND OF IBERIAN COPPER AGE MEGALITHIC GRAVES

Author(s): Bartelheim, Martin (Universität Tübingen) - García Sanjuán, Leonardo (Universidad de Sevilla)

Presentation Format: Oral

The session "Human-made environments: the development of landscapes as resource assemblages" is aimed at debating new concepts in the relationship between society and resource-use, with a particular focus on the role of resources in the construction of landscapes. In this paper we attempt to do exactly that by examining how burial assemblages mirror resource assemblages in Copper Age Iberia. We examine the contents of two specific tombs, Montelirio and Palacio III (Seville, Spain) located in very different physical environments (lowlands vs. highlands) for which detailed studies of the material culture are available, including quantification and provenancing of artefacts as well as, to some extent, functionality. Then we compare both burial assemblages to the resources locally available. Our discussion attempts to answer questions such as: Was there a personal or group identification with the locally available resources? What was the role of non-local (even exotic) resources in these tombs? What are the similarities and differences in the relationship between local and non-local resources among both burial assemblages? And what does that tell us about the society, ideology and landscape-making of that time? The result of our discussion suggests that no straightforward relationships can be established between availability and effective use of resources, just like there are important differences in the composition, representativeness and scope of both burials, suggesting varying cultural traditions and social practices.

15 THE KNOWN UNKNOWN: BRONZE AGE SETTLEMENT AND LANDSCAPE USE IN SOUTHWESTERN SPAIN

Author(s): Bartelheim, Martin - Chala Aldana, Döbereiner - Díaz-Zorita Bonilla, Marta (Universität Tübingen)

Presentation Format: Oral

The Guadalquivir valley in southern Spain with its perennial water supply belongs to one of the most fertile regions on the Iberian Pen-

insula, well connected above all via the river estuary. Consequently, it has been settled and cultivated intensively from the Neolithic until today. However, in the lower course of the river the Bronze Age is only little known, although several finds indicate the existence of a rich material culture like that in the neighbouring El Argar culture which has been intensively studied for almost 150 years. In this presentation we analyse the present state of knowledge about the settlement structure and the use of resources in the lower Guadalquivir valley and the adjacent mountain regions. In close comparison to the Argaric region and the preceding Chalcolithic we discuss patterns of specific landscape use and formation as well as their connection with social dynamics. The debate will examine tangible elements like remains of subsistence strategies as well as the exploitation of mineral or aquatic resources and also cover further questions like that of the recognition of itineraries or places with transcendental meanings. The objective is an approximation to how in prehistory landscapes were perceived and in which way they were shaped to meet the needs of the societies living in them.

16 A MARITIME PALIMPSEST LANDSCAPE: HISTORIC EXPLOITATION OF SCOTLAND'S COASTAL RESOURCES

Author(s): Graham, Elinor - Dawson, Tom - Hambly, Joanna (University of St Andrews; The SCAPE Trust)

Presentation Format: Oral

In many countries and for much of human history, access to the sea has been of great importance for a variety of purposes. Maritime landscapes are some of the most dynamic environments which offer access to a range of resources, and which have often been drastically altered to facilitate the exploitation of these resources. Offering mobility through access to the sea for transport, communication, trade, and war, coastlines themselves represent an important resource, and can also present opportunities to create land through reclamation, and harness water power.

This paper will present a case study from the Forth Estuary in Scotland, where the natural environment has been repeatedly and dramatically reshaped. Alteration of the coast edge to facilitate mobility by river and sea, and of the wider landscape in order to exploit different resources in the immediate and wider area reflects the changing demands of society and developing responses to a changing environment. The resulting palimpsest landscape contains evidence for modification of the coast and hinterland by a variety of groups and individuals for a range of purposes from the creation of a Royal naval dockyard lending it an internationally significant role in medieval European politics to the more prosaic local concerns of agriculture, trade and transport.

Further, this paper will examine the complex interactions between the human shaping of the landscape and the environmental consequences, and how successive transformations relate and impact on each other in this dynamic environment. Additionally, examination of the results of recent archaeological, historical and palaeoenvironmental investigations will ask how physical evidence of early activity can manifest in this landscape and what can be learned about the societies that have shaped it.

17 SHELTER SHIPS IN THE LITUS IMPORTUOSUM : SANTA SEVERA, CIVITAS VETULA AND CORNETO

Author(s): Combesure, Sara (Université de Picardie; Centre de Recherche en Arts et Esthétique; UMR 8546 CNRS-ENS)

Presentation Format: Oral

The Mediterranean coast between Santa Severa and Corneto (Rome, Italy) located about 50 km north of Rome, is a land, not very suitable for port installations.

The ancient texts and descriptions of medieval and modern portulans (Compasso de Navigare, Portolano di Grazia Pauli, Portolano di Parma Magliabecchi, etc. etc.) do not hesitate to emphasize this aspect, exacerbated by an important phenomenon of marine erosion, which in the last decades of las centuries has altered the coastal landscape.

Despite this, over the centuries, in this region the ports of the Etruscan city of Caere, the Roman port of Centumcellae and the medieval ports of Civitas Vetula and Corneto were active. From Trajan's times, this area, described by latin authors as a litus importuosum, was integrated into a wide network of trade in the Mediterranean sea, whose peak was reached in the XV century, after the discovery of the alum mines of Tolfa.

This paper will present current research on the medieval and early modern ports of the region and the practical infrastructure of travel and exchange. The research was carried out within the ANR Caecina support (Contacts et Acculturation dans l'Étrurie Classique : Images, Notions, Artefacts), thanks to the closer collaboration between French and Italian institutions : Université de Picardie, Université de Lille 3, UMR 8546 CNRS-ENS, Museo del Mare e della Navigazione Antica.

a. PALEOPEDOLOGICAL RECORD OF HUMAN ACTIVITY AND LANDSCAPE TRANSFORMATIONS AT THE MALBORK-WIELBARK SITE (NORTHERN POLAND)

Author(s): Luczkiewicz, Piotr (Institute of Archaeology, Maria Curie-Skłodowska University, Lublin) - Jankowski, Michal - Sykula, Marcin (Nicolaus Copernicus University in Torun, Faculty of Earth Sciences, Dep. of Soil Science and Landscape) - Noryskiewicz, Agnieszka (Nicolaus Copernicus University in Torun, Department of Archaeology, Environment Reconstruction Laboratory) - Kleemann, Jörg (University of Szczecin, Institute of History and International Relationships)

Presentation Format: Poster

The Malbork-Wielbark archaeological site is an important, eponymic site of the Wielbark Culture, linked with the Goths, located in northern Poland. The huge necropolis consisting of ca. 2000 graves dated to Pre-Roman - Roman - Migration Period was created in

marginal zone of the morainic plateau and the edge of the Vistula River delta. The cemetery was founded on sandy primarily forest soils (Podzols and Gleysols), that suggests strong deforestation also of neighbouring moraine plateau covered with more fertile soils (Luvisols and Retisols) as early as Pre-Roman times.

Stratigraphy of archaeological excavations shows several subsequent phases of landscape transformations. During the last ca. 1600 years three series of sediments were deposited as an effect of colluvial and aeolian processes, as well as of agricultural activity. All of these processes could have happened only on land surface devoid of natural vegetation cover. However, two generations of soils typical for mesotrophic forest (Brunic Arenosols) were able to develop in these sediments, evidencing two periods of forest succession and probably breaks in settlement and agricultural land use in the vicinity of the site. The construction of a Prussian fortification system at the break of XIX and XX Century was the last episode of intensive human impact on the landscape in the studied area. Actually, the archaeological site is covered with mixed forest, constituting an island in an intensively used agricultural landscape.

b. INTERDISCIPLINARY RESEARCH ON GOLD MINING AT AMALARA IN NORTHERN GREECE AND ITS EUROPEAN CONTEXT

Author(s): Jeneralek, Wojciech (Adam Mickiewicz University in Poznan)

Presentation Format: Poster

Thrace and Macedonia are the richest in gold regions in Greece. That metal was mining and extracting there probably since Late Neolithic. There is more or less 30 gold mining sites. One of them is Amalara. Amalara Project is realized in friendly cooperation of Adam Mickiewicz University in Poznań, Aristotle University of Thessaloniki and Ephorate of Antiquities of Thessaloniki. It is an archaeological site with a long-term settlement from the Early Bronze Age to the Ottoman period. Bronze Age settlement appears as a tumba. Next, in the Iron Age settlement moves to trapeza - natural hill flattened at the top. Byzantine and Ottoman buildings are scattered all over the area. Previous research during Anthemus Valley Archaeological Project revealed extensive rock debris which may be remains of a gold extraction. Comparative analysis with a Roman gold mining sites like Las Medulas, Las Cavenes (Spain) or Bessa (Italy) suggests Roman activity on that area, but gold could have been extracting also earlier. The project focuses on chronology and methods of gold extraction during each period and associated with it settlement process. In a project we are using a chemical analysis of the soil to prove the presence of the gold, geological mapping of the area and the photogrammetry to find every remnant of settlement in the mountain landscape and land transformation associated with extraction of the gold. Obtained data we are going to combine with a surface research.

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PIRENNE VS. GLASS: THE CONTRIBUTION OF ARCHAEOLOGICAL AND ARCHAEOMETRIC GLASS ANALYSIS TO THE STUDY OF EARLY MEDIEVAL LONG-DISTANCE TRADE NETWORKS

Theme: Mediterranean seascapes

Organisers: Herold, Hajnalka (University of Exeter) - Sindbæk, Søren (University of Aarhus)

Format: Regular session

Written round 80 years ago, Pirenne's thesis on the breakdown of links across the Mediterranean and between the Mediterranean and north-western Europe has become an emblematic point in the research of early medieval economy. This session explores what the archaeological and archaeometric analysis of glass, especially glass beads, can contribute to a better understanding of long-distance trade/exchange networks in the early medieval period. With various glass types being of Near Eastern/Middle Eastern origin, and the possibility of the chemical identification of these groups, glass is an ideal material type to study long-distance connections. Many of these connections linked the Mediterranean with areas in central and north-western Europe, while others connected to the south, to various regions of Africa and the Indian Ocean. This session aims to give an overview of current research on these long-distance networks.

ABSTRACTS

01 MOHAMMED, CHARLEMAGNE AND THE SIGNIFICANCE OF GLASS IN THE MAKING OF MEDIEVAL EUROPE

Author(s): Hodges, Richard (The American University of Rome)

Presentation Format: Oral

This talk will review the Pirenne thesis and the importance of glass-making, recycling glass and its symbolic significance in the revival of Europe as a political and trading entity in the 8th and 9th centuries. Examples will be drawn from recent research from numerous excavations in Albania, Italy, Germany, the Low Countries and the Baltic states. Glass more than any other medium offers archaeology the means to define the importance of Carolingian Renaissance, a key element in Pirenne's enduring thesis.

02 GLASS BEAD AND NORTH SEA EMPORIA. COMPOSITION, PRODUCTION AND PROCUREMENT OF GLASS AT AN EIGHTH CENTURY WORKSHOP IN RIBE, DENMARK.

Author(s): Sindbæk, Søren (University of Aarhus) - Barfod, Gry (AGiR lab, Aarhus University)

Presentation Format: Oral

One of the earliest crafts documented in the coastal trading towns or emporia of the early medieval North Sea world is the production of glass beads using imported raw glass. In workshop contexts, beads occur with Roman tesserae, transparent blue glass chips and colorless vessel glass. The main research question of this study is what the chemical composition of these potential raw materials and beads can tell us about their production. Are the beads solely made from remelting tesserae or are various glass sources mixed remelting? Over the course of the eighth century, the composition of workshop waste and bead types varies notably, raising the question if the networks of glass procurement changed in the course of Pirenne's pivotal century. Especially, did newly produced East Mediterranean plant-ash glass or European wood-ash glass come to supplement the long-established pattern of recycled Roman glass? The paper presents the result of major element compositions analysis using Electron Microprobe and minor elements (60 elements) by Laser Ablation Inductively Coupled Plasma Mass spectrometry (LA-ICPMS). They target chronologically well-dated and contextually excavated assemblages from a group of workshops ranging from the early to late eighth century in one of the principal nodes of early North Sea trade.

03 TRACING EARLY MEDIEVAL LONG-DISTANCE TRADE: 'ORIENTAL' GLASS BEADS IN EUROPE, C. AD 800-1000

Author(s): Herold, Hajnalka (University of Exeter)

Presentation Format: Oral

Archaeology has great potential for investigating long-distance trade/exchange networks, mainly by studying production centres and/or the geographical distribution of their products. Analysis works especially well for material groups where scientific methods can aid in identifying provenance in some form, as in the case of glass, pottery, and stone artefacts. In addition, for the early Middle Ages, investigations of these material groups usually offer insights on aspects of economy that are not covered by written sources. This paper considers archaeologies of early medieval long-distance trade/exchange networks in Europe, including ties to the wider Mediterranean world, as well as connections to more local European economies. Special attention will be given to glass – especially glass beads – that have huge potential to signpost long-distance trade and communication networks in this period. The macroscopic features (shape, colour) and chemical composition of glass beads provide an opportunity for tracing their provenance and distribution routes. Therefore, they are an ideal group of finds for developing an improved understanding of long-distance communication networks and interconnectedness. Specific 'oriental' bead types of this period include millefiori/mosaic eye beads and segmented beads. These beads are thought to have reached north-western Europe on two main routes, via the Adriatic and central Europe, and via the rivers north of the Black Sea.

04 EARLY MEDIEVAL GLASS WORKSHOPS AND TRADE AT THE HARBOUR OF COLOGNE

Author(s): Dodt, Michael (Römisch-Germanisches Museum Köln) - Kronz, Andreas (Geowissenschaftliches Zentrum Universität Göttingen)

Presentation Format: Oral

Cologne, that in Roman times was famous for trade of Glass, continued these craft skills into Early Middle Ages. The Glass workshops were concentrated at the harbour, which formed the reduced area of settlement together with the eastern part of the city after the Roman time. Beginning from the results of the excavation at the Heumarkt 20 years ago numerous remains of glass workshops on the harbour were examined within the DFG-project „The early Medieval Harbour of Cologne – Place of Production and Export of Glass“. Many glassworks existed there in a coherent area worked in Merovingian and Carolingian times. According to these results one can assume that glasses were produced for the long-distance trade. In order to prove the role of Cologne as an important Harbour of exchange numerous early medieval glasses at places – harbours, fair places and merchant settlements – along the Rhine and Main and on the shores of the North and Baltic seas are examined archaeologically and chemically. The chemical analyses are supplemented by many published analyses of the surrounding area of Cologne or places further away, which were in contact to Cologne, which were described by K. H. Wedepohl and co-authors. First results show a relatively consistent type of soda-lime-glasses ("weakHIMT" bzw "HIMT-2") for the Merovingian glasses of the Heumarkt. Apart exceptions the now known diversity of the late antique and medieval groupings of glass are not represented in Cologne. Wood ash-glasses are in very few Carolingian dated exceptions at the harbour of Cologne, while it is more represented at the Baltic Sea and in Unterfranken. Wood ash was used as melting tool for glass, when soda from Egypt was no longer available.

05 EARLY MEDIEVAL TESSERAЕ IN NORTHWESTERN EUROPE. LONG DISTANCE TRADE OR LOCAL SUPPLY?

Author(s): Van Wersch, Line (University of Liège; University of Leiden; UCLouvain)

Presentation Format: Oral

In northwestern Europe, between the Merovingian and the Carolingian period, a real shift occurs in craft organization. Artisans left

the previous central places and relocated in the countryside, in the monasteries and in the emporia (Henning 2007, Theuws 2007). Considering glass production, it is noticeable that this relocation goes hand by hand with one of main technological modification: the change of flux from soda lime to wood ash (Wedephol et al. 2011). In that regard, architectural glass will be particularly interesting. Indeed, if window glass is among the first to experience recipes transformations (Van Wersch et al. 2016), the tesserae used in the mosaics will long be made with material in the roman tradition (Neri 2016).

As Byzantine or Italian buildings, early medieval churches north of the Alps were also decorated with mosaics and small glass cubes have been found in several excavations. These were assembled to compose walls decorations but they were also a source of colored glass. In some workshops, they were fused in order to make other objects, especially window glass as attested by the monk Theophilus (Schibille & Freestone 2013). Written sources also testify for their recycling and their trade around the Mediterranean as well as between Italy and the Carolingian court (Neri 2016). However, up until now, no workshop has been found (James 2017). This paper offers to make an assessment and to draw the role of tesserae in the glass production, especially the one of architectural glass at the beginning of Middle Ages in northwestern Europe.

06 DISTANCE VS. TIME: SOME CONSIDERATIONS ON CHEMICAL ANALYSIS, RECYCLING, AND THE LONG-DISTANCE MOVEMENT OF GLASS

Author(s): Duckworth, Chloe (Newcastle University)

Presentation Format: Oral

It could be argued that the success of chemical analysis has raised the study of glass from a marginal sub-discipline, to one that is centrally relevant to the archaeology of many historical periods. Thanks to advanced scientific techniques, including trace element and isotope analysis, we are able to uncover the geochemical 'signature' of the raw ingredients used in glassmaking, and thus – the idea goes – to trace the provenance of the glass.

As demonstrated by the papers in this session, this has profound implications for archaeological models, particularly those relating to long-distance trade or movement. There is another side to glass chemistry, however, and it is one that has to date been under-represented when using glass as a proxy for social contact. That is, glass is a transmutable material, which could be modified, adapted and recycled at one or many points along its journey: the chemistry of the excavated bead, for example, may reflect multiple original glasses that were mixed together, or may have been extensively modified by secondary processes. Furthermore, the recyclability of glass, and the portable, robust nature of glass beads, makes it difficult to draw conclusions about the degree of social contact that the long-distance movement of this material implies.

In this paper, I discuss the secondary modification of glass, and argue that we need to place it at the centre of our chemical and typological analyses. I do not believe that these concerns diminish the current findings of chemical analysis; rather, that they provide a novel and interesting dimension to be explored.

07 USE OF NATRON-TYPE GLASS FROM THE LEVANT IN EARLY MEDIEVAL FRANCE

Author(s): Pactat, Inès (MSHE C. N. Ledoux - USR 3124, University of Burgundy - Franche-Comté)

Presentation Format: Oral

For more than a thousand years, most of the glass in Europe and the Mediterranean derived from the Levantine coast or Egypt. The abandonment of natron as flux and the collapse of the centralised production model of Antiquity represent one of the most important developments in the history of glass. During the last two decades, advances in the chemical analysis of archaeological glasses have established an increase in recycling prior to the adoption of plant or wood ash as alkalis at the end of the 8th or in the 9th century AD. In fact, Roman and late antique cullet represents the main source of supply in late Merovingian and early Carolingian secondary glass workshops in France. However, archaeological and archaeometric data have also demonstrated that raw glass was still used during this period to produce vessels and stained glass windows.

The present paper discusses the analytical evidence from early medieval glass workshops and several consumption sites in France (monasteries, churches, urban and rural settlements) dating to the late 7th to early 9th century. Analyses have been conducted by LA-ICP-MS at the Ernest-Babelon Centre (IRAMAT, Orleans) to determine the major, minor and trace element compositions and by extension the origin of the glass. Following the classification proposed by Phelps et al. 2016, the glass identified as uncontaminated by recycling turns out to come from the Eastern Mediterranean. Workshop waste and typological data show moreover that Levantine natron glass was locally transformed and not imported as finished products. This then prompts the question whether or not this type of virtually pristine glass was reserved for specific productions or commissions.

Phelps M., Freestone I. C., Gorine-Rosen Y., Gratuze B., Natron glass production and supply in the late antique and early medieval Near East: The effect of the Byzantine-Islamic transition, *JAS*, 75, 2016, 57-71.

GLAS AS EXPRESSIONS FOR URBAN FLOWS. THE CASE OF GERASA/JERASH FROM THE ROMAN TO THE EARLY ISLAMIC PERIOD

Author(s): Raja, Rubina (Aarhus University; Centre for Urban Network Evolutions) - Lichtenberger, Achim (Westfälische Wilhelms-Universität Münster)

Presentation Format: Oral

This paper will focus on the results of recent studies of the glass found in the Northwest Quarter of the Decapolis city Gerasa/Jerash, which flourished from the Roman period into the mid-eight century CE. The glas, which has been typologically and chronologically ordered and which date to between the Roman period (1st century CE) and the middle of the 8th century CE, when Gerasa was devastated by a heavy earthquake, has been found in the context of the archaeological investigations undertaken by the Danish-German Jerash Northwest Quarter Project, which has been on-going since 2011. Examinations have shown that glas stemming from the Northwest Quarter, both domestic and public contexts, was heavily recycled and reused beginning in the Late Antique period and continuing into the early Islamic periods. This observation tells us about the priorities of the urban society when it came to glas as an urban commodity. Furthermore the isotopic analysis of the glasses have shown that changes in the way in which fuel was used took place over time. This paper discusses the broader implications of these results and puts them into a broader cultural historical context pertaining to the region as well as the Mediterranean World in general.

a.

GLASS IMITATIONS OF STONE IN THE ROMAN PERIOD: SOME INSTANCES FROM BARCINO

Author(s): Revilla i Cubero, Emili (Museu d'Història de Barcelona - MUHBA) - Cisneros Cunchillos, Miguel (Universidad de Cantabria)

Presentation Format: Poster

Imitation has been a common phenomenon throughout history and continues to be so up to the present day.

Glass, ever since its origins, has consistently been used as a material to create substitutes. Glass vessels follow the shapes and patterns of others made of different materials such as hard and precious stones, precious metals (gold and silver), bronze and ceramic. The most elaborately decorated glass vessels find inspiration in prototypes of the finest crockery.

The use of ornamental and precious stones in the manufacture of vessels is known from the earliest Egyptian dynasties. The Romans came into contact with these luxury items through the Greek world and contacts with the East secured the supply of raw material and facilitated the use of coloured stones in jewellery and the decorative arts. Furthermore, the use of highly appreciated stone originating in remote territories was closely linked to the social and economic status of the owner. Classical sources mention glass imitations of stone beakers which are documented in archaeology as well as the use of glass crustae.

This poster shows some instances of this phenomenon originating in Barcino which are included in the investigation project *Ficta Vitro Lapis: Glass imitations of stones in Roman Hispania (HAR2015-64142-P)* (MINECO/FEDER, UE), whose main purpose is to identify glass imitations of ornamental and precious stones in the Roman Empire, the period of highest prevalence and popularity of this phenomenon.

The Museu d'Història de Barcelona (MUHBA) houses a significant collection of fragments of vessels unearthed in some of the most important excavations conducted in the city such as those in calle Avinyó, villa Sant Pau del Camp and Plaza del Rey.

YOU SEE A MAN'S HOME, YOU SEE THE MAN... HOUSES AND THEIR DECORATION IN THE EASTERN MEDITERRANEAN

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Rekowski, Monika (University of Warsaw, Institute of Archaeology) - Pensabene, Patrizio (University la Sapienza, Rome) - Gasparini, Eleonora (University la Sapienza, Rome) - Brzozowska-Jawornicka, Aleksandra (University of Science and Technology, Wrocław)

Format: Regular session

During the Roman Imperial period the houses gained an exceptional role in the urban elites' life. In the Eastern Mediterranean the residences of rich citizens, constituting the core of the new curial class, reflected a trend among provincial notables in the Greek east to express their Romanitas. In altering plans and selecting design elements of houses, their owners wanted to respond to the demands of the new Roman society of which they were members. Thus, the residences became a way of owners' self-presentation, the illustration of their status, political power or position in the society, reflecting simultaneously their traditional aesthetics and taste.

The main stress of Organisers' scientific interest is put on housing in Egypt, Cyrenaica and Cyprus, although all provinces of the Eastern Mediterranean may provide an opportunity to undertake such comprehensive studies.

The present session aims to perform a comparative analysis of housing to show the continuity (or discontinuity) of the Hellenistic tradition and the birth and development of new fashion during the imperial period. Looking for common characteristics and criteria of the housing decoration, we would like to emphasize architectural décor. We particularly welcome all papers investigating various aspects of tradition and innovation in housing in the Eastern Mediterranean, however our session panel is dedicated to all specialists interested in the domestic architecture,

its planimetry and decoration studied together. It may start discussion of the anticipated clear distinction between housing in post-Ptolemaic provinces as well as in any other provinces of Roman Empire.

ABSTRACTS

01 ALEXANDRIA, CYRENAICA, CYPRUS: PTOLEMAIC HERITAGE IN THE RESIDENTIAL ARCHITECTURE OF THE IMPERIAL ERA

Author(s): Pensabene, Patrizio (Emeritus Sapienza University)

Presentation Format: Oral

Ptolemaic domination has left a strong mark on the regions controlled by it. In particular, in Cyrenaica and in Cyprus there are architectural forms in the houses and villas of the imperial age that can only be explained within a cultural continuity in the ways of inhabitation of Alexandrian derivation. However, the changes made to this tradition are such as to justify the use of terms such as dialect or local language that differs from the models and that increasingly acquires its own autonomy. The individual components of architectural elevations such as capitals, cornices, columns and pillars have been treated several times. There is now a long history of studies on the Corinthian Alexandrian capitals, on the cornices with “travicello” modillions, on the heart pillars, etc., elements that are found throughout the geographical area included in the Ptolemaic domination. Here we want to stress some aspects related to the organization of space, such as the peristyle, the oecus Corinthius, the oecus Aegyptius and other types of reception rooms. Only a joint vision of Egypt, Cyrenaica and Cyprus allow us to better understand and complete the gaps that are often encountered in the archaeological documentation on the houses of the mentioned regions.

In particular, the reception rooms and peristyles of two houses in the district of Kom el Dikka in Alexandria, the House of Orpheus in Nea Paphos, the House with Triclinium of Kourion and the Roman Villa of Ptolemais will be taken into consideration.

02 GLOCALIZATION AND THE MARBLE TRADE

Author(s): Grawehr, Matthias (University of Basel)

Presentation Format: Oral

If the term “glocal” characterizes the influences of global developments on the local environment and vice versa, then the rise of the Mediterranean-wide Roman marble trade can be considered as a truly glocal phenomenon. Marble as a new aesthetical standard fundamentally transformed the local customs of decorating houses in the Levant, where the local stones were mostly soft and sandy. In the late republican and early Roman period a stuccoed finish of the local stones became the immediate reaction on the new aesthetics, propagated by the emperors in Rome. Soon, it seems, a new shining white marble style—in real marble or in stucco—became the distinctive mark of whoever had turned his attention toward these new global standards.

In my presentation I will focus on a parallel development that evolved as a local reaction to this global trend. Whereas, before the widespread use of marble, detailed reliefs had been carved out of the local soft stone and not been stuccoed over, this elaborate ornamentation seemed now adequate only for the marble style. In the local material a different aesthetic was now favored. The unaltered surface of the local stone was combined with simplified basic forms often representing the blocked-out state. I will trace this development for the decorations of private housings in the Herodian and Nabataean World, and I will show how this local usage soon developed into a truly vernacular style of interior decoration, that emphasized the local pride rather than the international connections.

03 THE GREEK SUBSTRATE IN THE HOUSES OF THE ROMAN COLONIES OF ANCIENT MAGNA GRAECIA. CULTURAL EXCHANGE FROM A WESTERN PERSPECTIVE

Author(s): Cortés, Ada (Sapienza university of Rome)

Presentation Format: Oral

This communication will show the analysis that is being carried out in the TETRASTYLON project (Marie Marie Skłodowska-Curie research fellowship). This project is designed to create the scientific basis for the identification and definition of a new type of Roman domus. This typological feature is the result of a hybrid house scheme between the Greek and Roman conceptions of housing. In the recent decades, some studies have found a particular typology of Roman house in different parts of the Empire. The structural scheme of this domus joins, in the first place, the concept of the development of the Greek habitat, and secondly, the use of the Roman atrium space as the central distribution area of the house. As result of this cultural symbiosis, it is possible to observe Roman distribution areas within Greek housing structural conceptions and the combination of very different architectural influences between both cultures. The house, named in a very preliminary manner “tetrastyle courtyard house, has been observed in different Roman cities with a Greek past, but in different geographical contexts and chronologies.

This type of house, with its variants, has not been enough analysed by the Roman domestic architecture studies. This communication will present different examples of this type of house in the territorial context of ancient Magna Graecia during Roman dominion. This approach will show the same exchanges between Greeks and Romans in the East but from the western perspective and at an early chronological moment.

04 HOW ROMAN ARE ROMAN HOUSES IN PTOLEMAIS (CYRENAICA)?

Author(s): Rekowski, Monika (University of Warsaw, Institute of Archaeology)

Presentation Format: Oral

In Ptolemais in Cyrenaica, an important port city founded already in the early Hellenistic period, several houses were uncovered: Palazzo delle Colonne, Roman House, House of Orpheus, House of Leukaktios, House of Serapios, House T, House G and House of Paulus. They differed in chronology - the beginning of the occupation of some of them dates back to the founding of the city and few houses remained in use until at least the sixth century A.D. But, at the same time they are all of important size, splendidly decorated and located in the representational parts of the city. Therefore, we can suppose that they belonged to the urban elites whose inherent feature was the desire to demonstrate their power and wealth through the residences. Especially in the Roman period, the member of municipal class were willing to manifest their Romanity. However, the houses all at once reflected the owners' taste for the traditional culture. So, the choices applied in the houses' decoration should reflected a mix of tradition and new ideas. It is even more readable in houses which were in use for more than two generations. The main question underlying my approach is not how the process of "becoming Roman" took place, but why it was possible to "become Roman" while still being Greek. The aim of this paper is to give an overview on the state of research this issue seen throughout the decoration of houses in Ptolemais.

05 ARCHITECTURAL DECORATION OF RESIDENCES IN NEA PAPHOS, CYPRUS, 1ST CENTURY BC - 4TH CENTURY AD

Author(s): Brzozowska-Jawornicka, Aleksandra (Wroclaw University of Science and Technology)

Presentation Format: Oral

Nea Paphos constituted the capital of Cyprus in the Hellenistic and Roman epochs. In the southern part of the city, in the region called Maloutena, a housing quarter developed with many remarkable and rich residences. The aim of the paper is to present the diversity and richness, the similarities and changes of the architectural orders and decoration of the paphian wealthy houses that occurred at the turn of the eras from the 1st century BC till the 4th century AD. Three extensive edifices will serve as examples: the Hellenistic House, the Villa of Theseus and the House of Aion, each of them representing a different scale and type of the residence: from a rich private house to a palace of the Roman governor of Cyprus.

The evolution of the architectural decoration occurring in the edifices, the changes of its scale, type, style and its position in the buildings, may indicate transformations which the housing architecture underwent in the late Hellenistic and Roman periods in the Eastern Mediterranean. The architectural embellishment of the Cypriot residences presents very close resemblance to the architecture of Ptolemaic and Roman Egypt, Libya or Near East, which proves relationships between the island and its neighbours. Therefore it is worth further comparisons and studies.

06 MOSAICS DECORATIONS OF TWO ROMAN HOUSES FROM ASIA MINOR

Author(s): Tülek, Füsün (Kocaeli University Faculty of Arts and Sciences)

Presentation Format: Oral

Domestic interiors of Romans are laid out and decorated intentionally as settings to reflect status, culture, wealth, and power of the owner. The interior decorations ought to be spectacular and influential for a Roman either a landlord or a businessman. The decoration of the interiors emphasizes function and hierarchy of a given space. Depending on contemporary fashion, taste, and choice of the owner units of a house are decorated with mosaic pavements in floral or geometric motifs expanding overall the entire surface or in figural representations of iconographic themes. Plain and austere decorations of the mosaic pavements are mostly employed at common spaces or on floors of units where mundane activities take place. Mosaics are laid out conforming floor of a unit, as well as defining circulation between the units. Floor mosaics may contain inscriptions communicating with the beholder about the use of the interiors. Besides inscriptions, figural representations of an iconographic theme or not convey utilitarian or philosophical messages. Two late Roman houses, a Domus in Cilicia Tracheia situated at the center of the polis, and a villa Urbana in rural Paphlagonia situated on a hill are lavishly adorned with colorful floor mosaics. Mosaic decoration of both of the houses underscores the value given to the perception of the status of the owner. Present paper inquires what exactly status and occupation of the owners might be regarding the decoration, as well as, size, plan, and location of these houses.

07 PERISTYLE DECORATION OF EPHEBUS'S SLOPE HOUSES II AND SOCIAL COMPETITION AMONG THE EPHESIAN ELITE

Author(s): Soy, Hüseyin (Middle east Technical University)

Presentation Format: Oral

The 'Slope Houses of Ephesus' expresses the lavishly decorated residential complexes of the Ephesian elite, of the capital of Asia Minor province in the Roman Empire. Situated at the heart of the city each of these residential units reveal the capacity of adaptation and/or resistance of their landlords through the study of their re-construction and re-decoration phases, which grants the houses and their owners a unique identity within the inner circles of the city elites' social competition.

In this paper we are going to concentrate on the peristyle decorations of two of these residential units (RU) of the Slope Houses II, of RU 4 and RU 1. The re-construction and re-decoration phases of RU 4 demonstrate a high capacity and dynamism to adapt to emerg-

ing needs of its owner through time, whereas the peristyle of the RU 1 displays a resistance to emerging new fashions of decoration and an adherence to tradition, thus revealing the needs of its landlord which maybe considered the same, with the neighbours' living in RU 4, however portrays a complete different attitude.

Finally, we aim to be able to comment on this binary behaviour of the Ephesian elite of the Roman Asia Minor with regards to themes of the preserved Hellenic identity and Romanisation of the Mediterranean East.

08 FLOORS, ARCHITECTURAL ELEVATIONS AND STATUARY IN LATE ANTIQUE RESIDENCES FROM EGYPT, CYRENAICA AND CYPRUS: SOME REMARKS

Author(s): Gasparini, Eleonora (Sapienza - university of Rome)

Presentation Format: Oral

This paper is focused on the decoration of some Late Antique residences in Egypt, Cyrenaica and Cyprus such as the Villas at Mehamara and Huwariya at Alexandria and in the Mareotis, the House of Esichius at Cyrene, the Villa of Theseus and the House of Aion at Nea Paphos, the House of Eustolios at Kourion and the Huilerie at Salamis.

They show common forms of urban elites' self-presentation across the Eastern Mediterranean between the 4th and the 6th centuries AD.

The analysis will be based on a global vision of social life in a world that is deeply influenced by the transition from old to new models and by forms of syncretism between various backgrounds, that merge in new decorative systems. An insight on the owner's cultural environment will be the means through which decor and power will be associated in the compared study of the main elements of these luxury residences.

Christianity will be one of the principal issue to be taken into account, together with the deep pagan roots of the aristocratic paideia during the investigated period. In fact the specific choice of iconographies in mosaics or of subjects for the statues that were displayed in these houses can be understood only if connected to the spiritual life of the period.

In the considered cities cultural identity is also manifested by forms of continuity in the architectural elevations. The fact that local traditions that developed during the Hellenistic period were still in use - both as reused building elements and as newly created decoration - can be interpreted as manifestation of the antiquity and prestige of the families that owned the dwellings.

These phenomena will be researched by the review of the quoted contexts and their compared analysis, in order to stress similar developments and their meanings.

302 GENDERED, DIVERSE, INCLUSIVE ARCHAEOLOGICAL MUSEUMS? PROPOSALS AND EXPERIENCES FOR A MORE EQUAL APPROACH TO HERITAGE

Theme: Museums and the challenges of archaeological outreach in the 21st century

Organisers: Gutmiedl-Schuemann, Doris (Freie Universität Berlin, Institut für Prähistorische Archäologie) - Prados Torreira, Lourdes (Dto. Prehistoria y Arqueología. Universidad Autónoma de Madrid; AGE) - Martins, Ana Cristina (Fundação para a Ciência e a Tecnologia / Instituto de História Contemporânea-CEHFCi-UE-FCSH-Universidade NOVA de Lisboa; UNIARQ-Centro de Arqueologia da Universidade de Lisboa; AGE)

Format: Regular session

During the last decades more and more archaeological museums started to include a gender perspective and developed new exhibitions and educational projects. By establishing a critical attitude towards the traditional androcentric discourses and gender roles, museums started to make not only women, but also other marginalized groups in society more visible. Modern archaeological exhibitions seem to be more diverse and inclusive.

Therefore, it is time to present and discuss the different experiences carried out in recent years in European archaeological museums with more gendered, diverse and inclusive approaches, in order to develop a framework of reflection in a "museology of gender and diversity", conceived as a more integrative, social and egalitarian approach to the heritage presented there.

Paper and poster proposals may include topics like

- theoretical advances in the studies of gender archaeology and its reflection in museums
- museums as an educational tool to achieve gender equality
- experiences in community museums and temporary exhibitions
- public studies as a diagnostic tool to advance in education of equality
- aspects of communication, journalism and merchandising
- experiences of museum educational service and informative departments

With the organization of this session, we intend to highlight the idea that archaeological museums can transmit an inclusive history that helps to make visible the traditionally marginalized groups of society, in order to contribute to a more egalitarian education and to provide a more

ABSTRACTS

01 INTRODUCTION

Author(s): Prados Torreira, Lourdes (Dto. Prehistoria y Arqueología. Universidad Autónoma de Madrid; AGE) - Martins, Ana Cristina (Fundação para a Ciência e a Tecnologia / Instituto de História Contemporânea-CEHFCi-UE-FCSH-Universidade NOVA de Lisboa; UN-IARQ-Centro de Arqueologia da Universidade de Lisboa; AGE) - Gutschmiel-Schuemann, Doris (Freie Universität Berlin, Institut für Prähistorische Archäologie)

Presentation Format: Oral

More and more archaeological museums established a critical attitude towards the traditional androcentric discourses and gender roles in archaeology, and started to include a gender perspective in their exhibitions and educational projects. By establishing a critical attitude towards the traditional androcentric discourses and gender roles, museums started to make not only women, but also other marginalized groups in society more visible. Modern archaeological exhibitions seem to be more diverse and inclusive, not only in the museums building itself, but also by using digital methods and social media. Various examples can be found that try to connect in their exhibitions with the every-day experiences and the every-day world of the various groups of visitors, to provide an easy access to heritage, and make it relevant for various visitor groups. Therefore, it is time to present and discuss the different experiences carried out in recent years in European archaeological museums with more gendered, diverse and inclusive approaches.

With our session, we intend to highlight the idea that archaeological museums can and must transmit an inclusive history that helps to make visible the traditionally marginalized groups of society, in order to contribute to a more egalitarian education and to provide a more equal approach to heritage. In our introduction, we would like to look back shortly on previous developments and improvements, but we would also like to sketch a framework for our sessions discussions.

02 LET'S TALK ABOUT GENDER: ARCHAEOLOGICAL MUSEUMS IN LISBON

Author(s): Martins, Ana Cristina (Fundação para a Ciência e a Tecnologia / Instituto de História Contemporânea-CEHFCi-UE-FCSH-Universidade NOVA de Lisboa; UN-IARQ-Centro de Arqueologia da Universidade de Lisboa; InterArq Project)

Presentation Format: Oral

Archaeology and gender and gender in archaeology it still a new issue in Portugal, mostly due to the specificity of the women's emancipation process which took place in the country immediately after the revolution of 1974. This is perhaps one of the reasons why only recently a small group of archaeologists – mostly women -, decided to get together and organize the first meetings that ever took place in the country on archaeology and gender. This is also why, for instance, the National Museum for Contemporary Arts organizes, for the first time in its history, a temporary exhibition on gender and arts. Of course there are some university research groups on feminine and gender studies, but they are mainly concerned with women, gender and education, politics and economics, and only in the last years began to appear the first works dedicated to the role played by women in the development of sciences, beginning with medicine.

Contextualizing this particularity of our history, we will try to understand the reasons why the two first archaeological museums in the country, both located in Lisbon (National Museum of Archaeology and Carmo Archaeological Museum), one National (public), the other institutional (private) and increasingly visited by nationals and foreigners, maintain an androcentric narrative in the artifacts shown, in the themes of the temporary exhibitions, in the catalogues and other publications sold, in the iconography chosen for the marketing, and in the speeches of the guided tours. Moreover, we will comprehend if the different types of actors involved in this process (visitors included) are really aware of the reproduction of such a narrative, and if so, what do they do to change it, if they do.

03 OBJECT INSIDE THE COMMUNITY. A DIFFERENT WAY TO LOOK AT THE TARTESIAN ARCHAEOLOGICAL HERITAGE OF HUELVA

Author(s): González-Campos Baeza, Yolanda (Instituto Andaluz del Patrimonio Histórico)

Presentation Format: Oral

We understand an archaeological heritage as a polyhedral research, which is recognized through its scientific values and others values added to it; as a human place where physical, economic, identity and other relationships between the territory and its inhabitants have been built over time. With this approach, a new proposal to portray the Tartessian archaeological heritage of Huelva in the museums has been made. This is supported by two principal ideas: acknowledgment of the social concept of Tarteso and the features of its archeology in Huelva.

These two ideas will be interrelated in developing a heritage interpretation project in which past and present go together, where the archaeological remains would help to develop the urban layout of a sustainable city, in accordance with the territorial policies. To accomplish this aim, we would use the landscape as an object of analysis and the museum, as a place connected to its surroundings, from where a link between science and community would be established.

All of this has defined, on the one hand, the basics courses of action and the tools on which the proposal about new display of the

Tartesian archeological heritage in Huelva's museum; and, on the other, to organize the elements in order to create a suitable exhibition for the needs of an, as a place opened to discussion, counting on the participation of the pluralist society and directly connected to its environment.

By this way, we would try to convey how archaeological heritage coexists in our times being part of the future, but also bringing past and present together.

04 RELECTURAS PROJECT. MUSEUM ROUTES IN GENDER CODE

Author(s): Soler Mayor, Begonya (Museu Prehistoria Valencia) - Jardón Giner, Paula (Universitat de València) - Pérez Herrero, Clara Isabel (Museu Comarcal Horta Sud)

Presentation Format: Oral

Relecturas is a museum's network itineraries that incorporate the gender perspective into the cultural visit. Six Valencian museums take part in this project. The aim of Relecturas is to offer different views directed to the collections of the participating museums, and our intention is to generate new discourses that allow the visitor to rethink women's role, patriarchal myths or social inequality between men and women.

Gender brings a set of traits (roles, attitudes, physical attributes, behavioral patterns, sexuality, etc.) that are associated with people, usually based on their sex, forming a system of classifying individuals into specific categories. Gender is not innate or static.

Femininity, masculinity, stereotypes, assigned roles ... are some of the topics addressed by the Relecturas project. Museum Routes in Gender Code.

Relecturas, is thought as a continuous dialogue between the museum and its surroundings. It proposes a cultural route that connects different museums of Fine Arts as well as Ethnography or History. To visit these museums is to reflect on the role of History in this matter and to question our role in the promotion of these attitudes. Relecturas offers different levels of information, it is up to you to decide what you want to know.

05 THE VISIBILIZATION OF WOMEN OF IBERIAN CULTURE (500-100 BCE) IN ARCHAEOLOGICAL COLLECTIONS AND THEIR REPRESENTATION IN MUSEUMS

Author(s): Prados Torreira, Lourdes (Universidad Autonoma De Madrid, Departamento de Prehistoria y Arqueologia)

Presentation Format: Oral

In recent years, archaeological discoveries have provided a new visibility for women of the Iberian Culture (developed mainly in the Mediterranean areas of the Iberian Peninsula), both in habitats and, above all, in funeral contexts and sanctuaries. Equally significant has been the reexamination of materials from old excavations, such as those from the necropolis of Baza in Granada, or El Cigarralejo in Mula (Murcia). This presentation will examine also the archaeological evidence that can be found in relation to textiles, by analyzing their presence in both the funerary contexts and in the sanctuaries of the Iberian Culture. We will discuss findings such as spindle whorls, looms weights, needles, etc; and study their multiple ritual meanings within their diverse archaeological context

The existence of these archaeological data has allowed us a new understanding of the roles women held in Iberian Culture. However, we must consider whether these advances in archaeological research have been accompanied by their appropriate exhibition in archaeological museums.

In this communication I will try to analyze, the way of exhibiting material culture in museums, as well as the way of representing the images of these women, especially in collective scenes, and the way of disseminating this culture in different archaeological museums.

The goal of this communication is also to call attention to the need for collaboration between illustrators and the museum's research and dissemination team.

06 WHOSE CAPITAL, WHOSE DESCENDANTS AND WHOSE HERITAGE? INCLUSIVE ARCHAEOLOGICAL PRACTICE AT LAOSICHENG

Author(s): Xu, Jian (Sun Yat-sen University)

Presentation Format: Oral

Laosicheng is a well-preserved archaeological site of highland urban center in northwest Hunan, dated no later than the early 18th century. Stone enclosures and platforms, elite residence, administrative and religious complexes had been kept in decent condition. It is identified as the headquarters of a powerful indigenous chiefdom, and enlisted as the world cultural heritage in 2014. The chieftain survived for four centuries, until its annihilation in the reign of Yongzheng (1722-1735) of the early Qing dynasty. The ruling family was forced to relocate by the central government shortly before the collapse of the chiefdom. The lack of the direct descending group leaves a subtle vacuum to the locals in legitimizing their ownership of the world heritage. Different interest groups have reshaped the continuing archaeology at Laosicheng by elaborating various particular dimensions, based on geographic location, ethnical identification and others. The most prominent, the search of minor or subordinated groups in history, enthusiastically promoted by modern villagers residing in the heritage park, successfully ushered the attention from the mere elites and dominants to cover a wider and more diversified spectrum. By including diversified groups, the Laosicheng archaeology, starting with unearthing

the remains of a local ruling class, unexpectedly reveals a highland society in full sense. Ultimately, it marks a profound transition in the practice of historical archaeology in China.

07 MAKING THE WAY TO A MORE EQUAL MUSEUMS APPROACH TO HERITAGE THROUGH STUDY PROGRAMS? A GERMAN PERSPECTIVE

Author(s): Gutmiedl-Schuemann, Doris (Freie Universität Berlin, Institut für Prähistorische Archäologie)

Presentation Format: Oral

If and how archaeologists at archaeological museums pay attention to aspects like gender and diversity when preparing and designing an exhibition is connected closely to their previous contact with this topics as well as previous experiences of inclusive environments.

The professional roles of archaeologists are mainly shaped during study times and professional training of future colleagues. Currently, 31 German universities offer undergraduate, i.e. Bachelor study programs in the field of archaeology; most of this universities offer also Master study programs, usually in the field of archaeology, but some also in the field of museums studies.

With this paper I would like to present some results on a comparative survey of study guidelines and examination regulations, especially by addressing the following questions:

- Do students of archaeology learn about museums and museum presentation? If so, at which stage of their study program, and to which extend?
- Do they learn about inclusion, and/or about gender and diversity?
- Are the two topics connected with each other? Do they prepare the future colleagues to provide more equal approaches to heritages at archaeological museums?

Finally, I would like to discuss, if study programs make the way to a more equal museums approach to heritage, and if not, how this could be or should be provided in the future.

305 DEPLOYING THE DEAD II: DEAD BODIES AND SOCIAL TRANSFORMATIONS

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Weiss-Krejci, Estella (Austrian Academy of Sciences) - Becker, Sebastian (Austrian Academy of Sciences) - Šmejda, Ladislav (Czech University of Life Sciences, Faculty of Environmental Sciences)

Format: Regular session

This session is the second part of "Deploying the Dead" which was successfully launched at last year's EAA in Maastricht. It explores the question of how the bodies of the long-dead and the material artefacts associated with them effect the living. We pursue an interdisciplinary methodology equally focused on archaeological and textual remains. Archaeological artefacts in literature evoke questions of agency and contribute to complicating and diversifying notions of historical time, to the undoing of chronology and to a blurring of the boundaries between past, present and future. This year, we specifically look at dead bodies in moments of social transformation and the reutilization of funerary monuments. The session invites papers that address one or more of the following questions: How have interactions with dead bodies and related artefacts been used in different time periods and cultures to underwrite, rewrite, or overturn narratives of national or community origin? How do shifts in foundation myths, e.g. between the Middle Ages and early modernity, initiate shifts in the treatment of the long-dead? How and why do material remains come to embody the past in the present, collapsing essential distinctions in temporality? What similarities and what differences can be seen in ways of dealing with human bodies and non-human artefacts in relation to historical myths and narratives? Under which circumstances were prehistoric mortuary structures reused by later populations?

ABSTRACTS

01 INTRODUCTION

Author(s): Weiss-Krejci, Estella - Becker, Sebastian (Austrian Academy of Sciences) - Šmejda, Ladislav (Czech University of Life Sciences, Faculty of Environmental Sciences) - Schwyzer, Philip (University of Exeter)

Presentation Format: Oral

This session explores the question of how the bodies of the long-dead and the material artefacts associated with them effect the living. We pursue an interdisciplinary methodology equally focused on archaeological and textual remains. Archaeological artefacts in literature evoke questions of agency and contribute to complicating and diversifying notions of historical time, to the undoing of chronology and to a blurring of the boundaries between past, present and future. We specifically look at dead bodies in moments of social transformation and the reutilization of funerary monuments. We will address one or more of the following questions: How have interactions with dead bodies and related artefacts been used in different time periods and cultures to underwrite, rewrite, or

overturn narratives of national or community origin? How do shifts in foundation myths, e.g. between the Middle Ages and early modernity, initiate shifts in the treatment of the long-dead? How and why do material remains come to embody the past in the present, collapsing essential distinctions in temporality? What similarities and what differences can be seen in ways of dealing with human bodies and non-human artefacts in relation to historical myths and narratives? Under which circumstances were prehistoric mortuary structures reused by later populations?

02 **THREADED ANCESTORS: THE USE OF (HUMAN) BONE ORNAMENTS IN EARLY BRONZE AGE AUSTRIA**

Author(s): Becker, Sebastian - Weiss-Krejci, Estella (Austrian Academy of Sciences) - Mandl, Kirsten (University of Vienna, Department of Anthropology) - Teschler-Nicola, Maria (Natural History Museum Vienna)

Presentation Format: Oral

Bone ornaments are a distinctive feature of the Austrian Early Bronze Age, but very little is known about their production, use and social significance. They may take the form of various types of disc, often with a perforation in the centre; rectangular and/or trapezoidal perforated pendants; rings and pins. These ornaments are known mainly from a number of large Bronze Age cemeteries in Lower Austria, where they are a recurrent feature of the deceased's personal repertoire.

Starting with the observation that in earlier and later periods, bone ornaments were occasionally made of human remains, a team of the DEEPDEAD project undertook a comprehensive study of the Early Bronze Age material. This paper provides an initial summary of this ongoing examination, focusing on three lines of enquiry: (1) Anthropological analyses of the bone ornaments provide important insights into their origins, use and production. Although the majority derive from animal remains, a few examples seem to have been made of human bone. (2) Archaeological analyses reveal important aspects of their social significance, as evidenced their role in Early Bronze Age funerary rituals. (3) Cross-cultural comparisons, utilising the Human Relations Area Files, help to better contextualise the social significance of bone ornaments, in particular, those of human origin.

The results of this multidisciplinary approach shed light on the Early Bronze Age as a period of social transformation. What was the significance of (human) bone as a decorative material at a time when metal began to assume that function? What did it mean to wear ancestral bones on the body? These are some of the questions we will engage with in this paper.

03 **THE IMPERMANENCE OF DEATH: TOMB REUSE IN CENTRAL APULIA IN THE 4TH CENTURY BCE**

Author(s): Peruzzi, Bice (Rutgers State University of New Jersey)

Presentation Format: Oral

This paper analyzes the relationship between burials and collective memory, focusing on the widespread custom in pre-Roman Central Apulia of violating and reusing tombs. I argue that this practice was the expression of complex strategies used by specific social groups, who alternately rejected, incorporated, and reinvented shared memories, to create a narrative about their past.

Removing grave goods and displacing bones from within a tomb allowed the mourners to de-emphasize the individuality of its original occupant –turned into an unrecognizable, anonymous “ancestor”– while transforming the interior of the newly cleared-out tomb into a focal point in the mnemonic landscape of the community that linked the present funeral with the memory of previous ones.

As illustrated by sites such as Rutigliano and Gravina, tomb re-use became prevalent in Central Apulia during the second half of the 4th century BCE; this period is also characterized by a dramatic increase in the number of tombs and a shift in the settlement pattern. The archaeological evidence seems to suggest that these changes were not just the result of demographic growth; rather, the late 4th century BCE was a period of great social transformations and new groups within the population gained visibility and power.

In such times of social restructuring, when competition for authority must have been the rule, being able to own a piece of the shared past must have been particularly appealing. Thus, these new Central Apulian elites took over preexisting tombs and incorporated them into their own funerary practices, as a way of legitimizing their authority and claiming their (real or fictitious) place in the history of the communities.

04 **THE TIMES THEY ARE A-CHANGIN': TOMB REUSE AND TIME PERSPECTIVES IN PRE-ROMAN VASTE AND CAVALLINO**

Author(s): Hoernes, Matthias (University of Innsbruck)

Presentation Format: Oral

From the beginnings of the discipline, funerary assemblages, regarded as ‘closed finds’, have served as a keystone for constructing archaeological chronologies. It is only in the past few decades that the temporal dimension of funerary assemblages has been explicitly addressed from different methodological and theoretical angles, such as time perspectivism. Even closed single-phase contexts envelop different ‘temporalities’, since the ‘lifetime’ of objects deposited in a grave covers different time spans, bodies go through temporally discrete stages from death to burial and beyond, and the history of monuments transcends the moment of their erection. The temporal dimension of funerary assemblages multiplies in the case of reused graves whose material record is, by definition, the outcome of a series of practices and processes through time. In pre-Roman Apulia, tomb reuse is a ubiquitous but regionally and locally diverse phenomenon, transgressing grave types as well as categories of gender, age and social standing and showing significant differences in intensity, chronology, and modality. Taking necropoleis in Vaste (Fondo Melliche) and Cavallino on the Salento peninsula as a case study, I want to conceptualize both bodies and objects as multi-temporal palimpsests. Focusing

on how bodies were deposited, manipulated and re-deposited in the course of time, alongside (other) material objects being re-arranged, re-associated with the 'old' dead, appropriated for a newly deceased, or retrieved, I try to disentangle the complex temporality of reused tombs by applying differing timescales. Moving from the methodological to the interpretative level, I want to reflect on whether the time depth of the archaeological record corresponds to time perceptions of past communities and groups who, by reusing tombs over time, engage with and act on the dead, the past and social memories.

05 LITERARY TOMBS AND ARCHAEOLOGICAL KNOWLEDGE IN THE TWELFTH-CENTURY 'ROMANCES OF ANTIQUITY'

Author(s): Howell, Naomi (University of Exeter)

Presentation Format: Oral

Twelfth-century literary 'romans d'antiquités' such as the anonymous Roman d'Eneas (c. 1160) and Benoît de St. Maure's Roman de Troie (c. 1165) feature elaborate descriptions of the tombs of legendary heroes and warriors. These descriptions are frequently far more detailed and imaginative than the exemplars found in classical texts. Although the romances of antiquity are works of fiction, their descriptions of ancient burial practices reflect the influence of written accounts of actual tomb openings and exhumations in the preceding century. Thus, the description of the burial of Pallas in the Roman d'Eneas is partly modelled on the chronicler William of Malmesbury's account of the discovery of the 'real' tomb of Pallas in Rome, c. 1045. Details in the literary text such as the presence of an ever-burning lamp in Pallas's tomb and the measures taken to preserve his body are borrowed from the chronicler. Similarly, in the Roman de Troie, the tomb of Hector with its distinctive enthroned burial is based in part on accounts of the opening of the tomb of Charlemagne by Otto III in the year 1000. This paper explores the interaction of imaginative literature and archaeological knowledge in western Europe in the middle decades of the twelfth century.

06 BURIAL REUSE IN FELIX'S VITA SANCTI GUTHLACI

Author(s): Hartmann, Jan-Peer (Freie Universität Berlin)

Presentation Format: Oral

This contribution focuses on the issue of burial reuse in Felix's Latin Vita Sancti Guthlaci. In contrast to practices that involve the continuous use of monuments as burial sites over a prolonged period of time, burial reuse – which can be defined as the discontinuous use of earlier funerary monuments – can often be taken to indicate a community's engagement with the more distant past and may thus potentially give insights into that community's perceptions of the past and the historical processes by which it is separated from it. The Vita Sancti Guthlaci has its protagonist live in or on a burial mound in the East Anglian Fenlands, where he is subjected to a number of spiritual struggles with evil spirits or devils. While Guthlac's struggles and his eventual purging of the island's demonic visitors can be read in terms of a narrative of colonization, the fact that these events take place in and around a burial mound and also that the saint has his own body buried in that same mound after his death, point to a more complex engagement with the Fenland's past. The paper seeks to combine archaeological and literary evidence to explore Anglo-Saxon perceptions of burial reuse.

07 FIRE IN THE CUSTOMS OF ALL SOULS' DAY OF THE EASTERN SLAVS IN COMPARATIVE CONTEXT

Author(s): Wawrzyniak, Joanna (Cardinal Stefan Wyszyński University, Faculty of History and Social Science, Institute of Archaeology)

Presentation Format: Oral

This paper discusses the changing role of fire in the customs in eastern Poland (Podlachia and Belarus in particular) that through the introduction of Christianity were transformed into All Souls' Day. The paper relies on archaeological data as well as historic and ethnographic accounts from the Middle Age to modern times. Despite their undeniable transformation and the ideological change between the Middle Ages and now, these rites and the use of fire have fulfilled and still fulfill an important role in family 'festivities' for dead relatives.

According to archaeological sources, among the Eastern Slavs, in the middle Ages in the area of Podlachia, fire was not only used for cremation of the corpse but, as evidenced by the remains of charcoal and ash, for the preparation of the burial place and cleaning the tomb or the grave pit. Fires were also left to burn besides inhumation graves and fire served as the basic element in commemoration rituals during grave visits. From the written sources we know that among the Eastern Slavs, in addition to remembrance and prayer for the dead on the 4th, 9th, and 40th day after death as well as death anniversaries and so called 'roditelskije soboty' (= Ancestors' Saturdays) there were also spring and autumn rituals called 'dziady'. During these periods, people brought food to the graves, sung songs, wept, lamented, played various games and burned fires. The burning of the fires most commonly took place overnight at home and in the cemeteries to illuminate the way for the transmigration of souls between the two worlds. The written sources from the eleventh to the sixteenth century also include descriptions of similar pre-Christian, pagan customs.

08 « FRANCE IS THE COUNTRY OF THE FRANKS ». CONSTRUCTION OF A NATIONAL IDENTITY THROUGH MEROVINGIAN BURIALS

Author(s): Noterman, Astrid (Stockholm University; CESCUM (UMR 7302)) - Klevnäs, Alison (Stockholm University)

Presentation Format: Oral

For centuries the baptism of Clovis was for French historians the starting point of France's history. Before this event, Gaul was above

all Roman and had no identity of its own. Thanks to archaeological digs since the 1840s, French historians and archaeologists have the material to write, and most often to rewrite, the origin and history of the country. According to the political context, the legacy of the Franks has been used to prove the superiority of civilizations that preceded or followed it, or on the contrary to legitimize the Germanic and Catholic origin of France. Until the middle of the 20th century, Franks were widely described by historians as uneducated, rude and greedy warriors. Grave disturbance was the proof: the vanity of Merovingian families led them to bury their dead with their finest and expensive adornments and weapons, thus encouraging plundering. The 19th century interpretation of Gregory of Tours' texts does not show a very different picture.

From the study of Merovingian graves, and more particularly the example of the practice of grave reopening, we will see in the ways in which French historians and archaeologists have constructed national identity. How was the Frankish legacy forged from archaeological remains, but also from a certain reading of the texts of Gregory of Tours, Paul the Deacon and Einhard?

09 ONE DYNASTY, TWO COUNTRIES: THE DIVERGENT FATES OF TWO COLLECTIVE HABSBERG TOMBS

Author(s): Weiss-Krejci, Estella (Austrian Academy of Sciences)

Presentation Format: Oral

This paper discusses the history of two large collective royal crypts commissioned by members of the Habsburg dynasty in the late sixteenth and early seventeenth centuries. The first is the Rudolfinian Crypt underneath St Vitus' Cathedral in Prague in the Czech Republic; the second is the multi-chambered Capuchin Crypt beneath the Capuchin Church in Vienna, Austria. The crypt at St Vitus' Cathedral was founded by Habsburg Emperor Rudolph II (died in 1612). In 1590 it received its first bodies, which had been exhumed and reburied from medieval graves. The Capuchin Crypt, which was founded by Queen Anna (died in 1618), was provided with funds in 1617, but was only ready in 1633 to receive the bodies of its foundress and her husband, Rudolph II's younger brother and predecessor, Emperor Mathias (died in 1619).

Throughout the centuries, both tombs experienced the addition of new coffins, reorganization of bodies, coffin opening, renovation, and reconstruction. The Capuchin Crypt in Vienna was continuously enlarged. The paper discusses these reorganizations in the light of the social transformations that took place from the late sixteenth to the twenty-first centuries in the Czech Republic and in Austria and shows how the different political histories of these two countries have led to divergent postfuneral treatments of the bodies, intestines and hearts, coffins and visceral urns, funeral objects and the clothing of the deceased.

10 FROM SAINT TO AN ANTHROPOLOGICAL SPECIMEN. THE TRANSFORMATION OF THE ALLEGED SKELETAL REMAINS OF SAINT ERIK

Author(s): Kjellström, Anna (Department of Archaeology, Osteoarchaeological Research Laboratory, Stockholm University)

Presentation Format: Oral

Erik Jedvardsson, the king of Sweden, was slain the 18th of May in AD 1160. Although not formally canonized by the Holy See, king Erik was regarded as a saint by the church in Sweden from the end of the 12th century, and in 1257 his remains were exhumed and placed in a reliquary in Uppsala Cathedral. Based on historical records and osteological investigations it is clear that the bones have been subjected to much attention of a physical nature during the centuries.

The traces of modification bear witness of the strong agency the relics possessed. Initially they served as communicators with God; the relics were reverently touched but also subdivided for distribution to other religious institutions. After the Reformation the remains were kept in the reliquary but they functioned as exclusive heirlooms, embodying a fallen king whose mythical past was of historical interest. In the age of Enlightenment the authenticity of the bones started to be questioned. During the latest century the remains were recognized as antiquarian objects, subjected to scientific investigations. Since 1915 no less than three thorough anthropological examinations have been conducted using existing state of the art techniques, the latest in 2014.

This presentation will discuss the interaction between the physical remains of saint Erik and the society. The transformation from sacred items, to a royal body and then to anthropological specimens, can be related to shifts in the religious framework and prevailing hegemonic narrative. Though this have not lead to major changes in the historical understanding of the medieval king, it has clearly affected the tactile approach to the bones in the shrine.

11 "IN SPITE OF DEATH & HIS PLAGUE, TO MAINTAIN THE MEMORY [...]": PLAGUE PAMPHLETS AS MONUMENTS TO THE ANONYMOUS DEAD

Author(s): Briest, Sarah (FU Berlin)

Presentation Format: Oral

Plague pamphlets like Thomas Dekker's *The Wonderfull Yeare* (1603) and *A Rod for Run-awayes* (1625) recount devastating, large-scale outbreaks of bubonic plague in early modern London, chronicling a metropolitan state of crisis in which normality is suspended and Londoners live in mortal fear of the dead and the dying (while country folk live in mortal fear of Londoners). Amid the sheer terror of contagion, with hospitals and cemeteries overflowing and the urban economy at a standstill, customary funerary rites must often be abandoned; coffins become scarce while mass graves become common, and the bereaved often cannot attend interments. Although a debate over the orderliness of early modern plague burials continues (given new archeological impetus by the recent Crossrail excavations in London), there is no doubt that tens of thousands succumbed to the dreaded disease in the course of

a major outbreak, within and without the city walls, many of them without adequate care in their final days or hours, with neither individual grave markers, nor common, public memorials erected in their name. In this paper I will discuss the ways in which Dekker's pamphlets seem to fill a commemorative vacuum and to constitute a literary monument to the innumerable, anonymous dead. The *Wonderfull Yeaere* in particular speaks up for the dead – not on behalf of their immortal souls but in recognition of their mortal sufferings. The dead may be beyond the reach of the living but it appears the living can still be held to account by the dead. In light of this, I will argue that the pamphlets not only serve as a castigation of general sin (the assumed cause of “the pestilence”) but as an urgent testament to those particular sins committed in the midst of an epidemic against the poor, the infected, and their mortal remains.

12 ‘THE GROUND IS MADE OF THE BODIES OF CHRISTIANS’: HISTORICAL AND LITERARY PERSPECTIVES ON NECROSOLS

Author(s): Schwyzer, Philip (University of Exeter) - Šmejda, Ladislav (Czech University of Life Sciences, Faculty of Environmental Sciences)

Presentation Format: Oral

Recent research conducted as part of the DEEPDEAD project has shed light on how the decomposition of human remains alters the chemistry of graveyard soils. The science is new, yet past cultures were well aware that graveyard ‘dust’ contained the remains of human beings: ‘for dust you are and to dust you will return’ (Genesis 3:19). This paper examines the conflicting literary depictions of necrosols in the works of two major English writers of the early seventeenth century, William Shakespeare and John Donne. In Shakespeare's *Hamlet*, the decomposition and scattering of human matter is seen as the final indignity, a fate arguably worse than death itself. For John Donne, on the other hand, the distribution of infinitesimal human remains in the soil and atmosphere represented a means whereby the dead might continue to participate in living Christian communities. As Donne wrote in one sermon, ‘all the ground is made of the bodies of Christians... Every grain of dust that flies here, is a piece of a Christian.’ These voices from the seventeenth century provide a means of historicizing our current understanding of the build-up of chemical traces of decomposed bodies in graveyards. They may also be capable of informing future debates about how best to mitigate the environmental consequences of traditional burial practices.

312 ANCIENT POTTERY IN CENTRAL ASIA: LARGE SCALE PERSPECTIVE ON THE PRODUCTION SYSTEMS AND THE CULTURAL INTERACTIONS

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Martínez Ferreras, Verónica (ERAAUB, Department of History and Archaeology, University of Barcelona) - Luneau, Elise (German Archaeological Institute - Eurasia Department)

Format: Regular session

Studies on ancient ceramics from Central Asia have traditionally focused on the definition of the morphological and decorative attributes of the vessels to aid in shaping a relative ceramic chronology and in setting up connections between sites and areas. Recent studies applied to the central Asian corpuses, some of which incorporate the archaeometric characterisation of ceramics, bring nowadays a broader view of the ceramic production systems, the trade dynamics, and the technological and cultural interactions over time in Central Asia. This territory has witnessed continuous cultural contacts between sedentary, nomadic and semi-nomadic populations favored by large ethnic processes and the Silk Road. It has also been the framework of the development of major historical entities, such as the Oxus Civilization or BMAC, the Achaemenid, Seleucid, Greco-Bactrian, Kushan, and Sasanian before the expansion of Islam. All the local cultural entities developed their own material traditions according to the respective social complexity. However, questions arise regarding continuities and disruptions between periods and at different spatial scales (“ceramic provinces”) and interrelations (technological and cultural transfer). The goal of the session is to bring together researchers currently working on multidisciplinary studies on the pottery produced and used in Central Asia from the Neolithic to the Islamic period, focusing on the patterns of production, distribution and use of ceramic vessels. We also aim to examine the cultural interactions, the fluctuation of the networks of exchange and the development of the production systems in a wider chrono-geographical framework.

ABSTRACTS

01 THE MATERIALITY OF PERMANENCE AND COHESION WITHIN NOMADIC CONTEXTS OF BRONZE AGE EASTERN EURASIA

Author(s): Dupuy, Paula (Nazarbayev University)

Presentation Format: Oral

Ceramic descriptions occupy a long history of providing material evidence for tracing routes and patterns of ethnic, social, and ideological cohesion among pastoralists of Bronze Age Eurasia. In concentrating most heavily on morphological and decorative attributes of pottery those descriptions highlight macro-consistencies in ceramic style spanning assemblages recovered from southern

Central Asia to Siberia. In recent years, however, new evidence has exposed greater technological variation in site-level ceramic production practices thereby compelling a reconsideration of regional unity models. Despite such findings, the prior focus on material culture has been eclipsed by a growing archaeological science focus on the economy of pastoral subsistence. This movement has shown how localized human-environment adaptations characterized Eurasian pastoral systems across millennia and in doing so contributes new insight into the various offsets of risk and resilience within nomadic ways of life for the Bronze Age. Moreover, these findings generate new sets of questions related to how pastoralist materiality fits within the shaping of Eurasian prehistory. This paper addresses this issue through a focus on pottery complexes unearthed from settlements and cemeteries in the eastern steppe zone of Eurasia. Using these case studies, the underlying practicalities of the style-technology dichotomy in prehistoric nomadic production and consumption contexts are examined. In doing so a case is presented for understanding ceramic materiality as an agentive tool for achieving group longevity and stability among mobile societies who habitually navigated economic risk and resilience during the Bronze Age.

02 ARCHAOMETRICAL ANALYSES RESULTS OF BMAC POTTERY FROM THE ROXIANA PROJECT

Author(s): Luneau, Elise (Deutsches Archäologisches Institut, Eurasien-Abteilung)

Presentation Format: Oral

The Oxus civilization or Bactria-Margiana Archaeological Complex appears as the first proto-state culture in Central Asia, marked by the early stages of a standardized ceramic production. Current research aim at characterizing the wares (chronologically, stylistically and technologically), defining the homogeneity of the production and tracing the networks of exchanges.

This paper will present the results of recent archaeometrical studies on Bronze Age pottery from southern Central Asia. Contrary to what is commonly perceived, Bronze Age pottery related to the Oxus civilization is quite diverse in raw material, processes of fabrication and decorative pattern. The type of fine ware, beige-yellowish or orange, is predominant and appears visually very homogeneous over the whole territory of the BMAC/Oxus civilization (similar morphological types, process of making and paste). However, petrographic and chemical analyses of the composition reveals differences at the regional scale at least, and sometimes at the scale of the site. Besides, several other types of fine, intermediate and coarse wares are characterized by a high proportion of temper composed of crushed shells, rocks inclusions and/or chamotte. They differ also by the method of fashioning, mostly handmade by coiling or slabs. The distribution of these wares is unequal, in regard to the temper and the morphological range, which questions the geological environments or social boundaries between the regional groups. Lastly, in most cases, the chemical studies rather indicate the probable local origin of the clay, throughout the duration of the BMAC/Oxus civilization, suggesting the weak significance of vessel imports.

03 P-XRF STUDIES OF LBA CERAMICS FROM SOUTHERN UZBEKISTAN

Author(s): Kaniuth, Kai - Schauer, Michaela (Munich University)

Presentation Format: Oral

The Late Bronze Age (first half of the second millennium BC) of Southern Uzbekistan is commonly referred to as the Sapalli Culture, a regional group of the wider Namazga VI or BMAC circle. Best known for its burial evidence and architecture, studies of Sapalli Culture ceramics have been mostly restricted to typological studies, with the aim of furthering our grasp of chronology.

The small site of Tilla Bulak, located in the intermontane border triangle of Uzbekistan with Turkmenistan and Afghanistan, was excavated from 2007-2010 by a joint team of Munich University and the Fine Arts Institute, Tashkent. Analytic studies on pottery have been conducted in cooperation of Munich University and University College London. Our primary goal was to determine, whether the ceramic material recovered during excavation, and which was fabricated to the same high standards as that of the central settlements in the alluvial plain, had actually been produced locally.

Preliminary results suggest, that this was indeed the case. The field of our enquiry shall now be widened by sampling pottery from Tilla Bulak and three other Sapalli Culture sites, the eponymous Sapallitepe, Dzarkutan and Ara Bulak, with p-XRFA (Niton XLT 3), in order to develop an idea of pottery production and circulation among these Late Bronze Age sites.

04 THE DIFFERENTIATION OF THE YAZ II AND YAZ III PERIOD IN FIELD SURVEY. A VIEW FROM SERAKHS OASIS (TURKMENISTAN)

Author(s): Bulawka, Nazarij (University of Warsaw, Faculty of History, Institute of Archaeology, Department of Near Eastern Archaeology)

Presentation Format: Oral

The pottery chronology forms units that enable archaeologists to study the settlements patterns and diachronic changes in the landscape. This, however, is a toilsome task when considering the current state of research of pottery chronology of the Iron Age in Central Asia. Most pottery typologies existing in Central Asia were developed for the full vessels, which were less useful for field survey.

The transition of the middle (Yaz II) and late Iron Age (Yaz III period) is considered to be an important moment in Central Asia history. The Yaz III period is chronologically close to the reign of Achaemenids, who were famous for their large investments in agriculture and influence on the economy across Near East. This may imply that studying settlement patterns of Yaz II and Yaz III we will be able

to see the changes before and after the reign of Achaemenids.

This is particularly important for Serakhs oasis, an area located at Tedjen-river near the border with Iran and Afghanistan. The current result indicates the existence of 21 sites in the region that contain material of Yaz I-III period.

The paper will discuss the past and recent developments in pottery typology of Yaz II and Yaz III period from the perspective of field survey results for Serakhs oasis.

05 SOME TECHNOLOGICAL ASPECTS OF CERAMIC COMPLEXES AS ADDITIONAL SOURCE ON CHRONOLOGY AND HISTORY OF CENTRAL ASIA IN EARLY IRON AGE

Author(s): Mokroborodov, Viktor (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Large-scale archaeological investigations of the Central Asian sites of the middle of I millennium BC helped to approach the solution of many problems. However, along with other questions, the issues of detailed chronology of archaeological complexes, as well as a number of aspects of interaction between carriers of different types of economy, remain not fully clarified.

Traditionally, the main criterion for analysis of ceramic complexes, are morphological differences in forms of vessels. But, in the case of objects of our chronological range, characterized by the very stable kit of ceramics (Yaz III type), the appeal to other tools seems necessary.

The study of ceramic material from the excavations of the author in the South of Uzbekistan has led to the conclusion – an additional parameter for the definition of complexes VI-III centuries BC is the analysis of percentage ratio of wheel-made and hand-made ceramics in these complexes. In such microstratigraphically studied sites as Kindyktepa, Kizyltepa, Paykend, Kurganzol, Gishttepa on materials of late Achaemenid period we can see the significant increase in number of hand-made ceramics. After the change of historical formations is obvious the tendency to reduce the number of hand-made vessels. This thesis confirms the analysis of materials from Talashkantepa I, Kampyrtepa, Afrasiab, Erkurghan, etc.

These facts, in addition to obtaining one more criteria for more detailed chronology of sites, may indicate some change in the composition of population of South Central Asia at the end of Achaemenid period. This hypothesis is generally not contradicted by observations of other components of archaeological complexes and by information from written sources.

06 ACHAEMENID AND HELLENISTIC ASSEMBLAGES FROM BACTRA, AFGHANISTAN

Author(s): Maxwell-Jones, Charlotte (Aga Khan Trust for Culture)

Presentation Format: Oral

The excavations of the French Archaeological Delegation in Afghanistan at Bactra, Afghanistan from 2004-2008 produced a large corpus of pottery, including stratified deposits from the Achaemenid and Hellenistic periods, chronological periods for which ceramic material had been found, but not in stratified contexts. The ceramics from the Bactra excavations are from two main areas of the site, Tepe Zargaran and the Bala Hissar. They have been dated relatively by stratigraphic and statistical methods. Rough absolute dates are based on architectural and numismatic evidence. The major identifying features of the wares of both periods' assemblages are distinct, and there is a shift from communal vessels produced with a high degree of standardization to individual dining vessels, with far more variety in fabric, decoration, and shape than previously seen. This paper investigates the potential causes of and mechanisms for the homogeneity in ceramic production during the Achaemenid period and possible reasons for the shift to more diverse assemblages in the Hellenistic period. The geographical boundaries of the highly standardized Achaemenid wares, extending throughout large areas of modern Central Asia and Iran, will be compared with the boundaries of the Hellenistic wares. Finally, regulatory mechanisms that influenced these boundaries and shifts in forms will be investigated.

07 THE HELLENISTIC POTTERY IN NORTH-EAST BACTRIA LOCAL POTTERY TRADITIONS AND THEIR DISTRIBUTION COMPARED TO THE RESULTS OF THE PXRf ANALYSES

Author(s): Junker, Kristina (Deutsches Archäologisches Institut)

Presentation Format: Oral

The term "Hellenistic pottery" is associated with various ceramic wares and shapes. This is not surprising, since the period of Hellenism developed a great variety, which is visible in the material culture. Nevertheless some shapes can be defined as leading forms of the entire "Hellenistic world". In Hellenistic Central Asia these vessel types usually form only a small section of the entire pottery collection of one site, which is dominated by local shapes and traditions. Therefore it is worthwhile to focus on these pottery groups and to analyse not only the typology but especially the technical and chemical character of the ceramics of each archaeological sites. Regional and local links can often be clearly analysed using the local produced and developed pottery traditions.

This paper attempts to define the Hellenistic pottery, which was found in the settlement and the sanctuary of Torbulok, Tadjikistan (Hellenistic Bactria). The ceramic material is subdivided into nine ware groups that can be connected to certain pottery shapes. This close connection between technology and typology indicates a high degree of specialization. Furthermore, about 120 sherds, including all ware groups, were analysed with pXRf and petrographic thin sections were made, to recheck the visual subdivisions. The comparison of the analysis of the natural ground with the chemical composition of the pottery sherds is intended to discuss the

question of a possible local ceramic production in Torbulok. Another focus of this paper is the regional comparison with other sites of north-east Hellenistic Bactria. In addition to the typological similarity, the chemical comparability will highlight the character of the individual pottery traditions of each finding spot. Is there a technical connection between the material from Torbulok, Takht-i Sangin and Saksanokhur? Can we therefore speak of a “ceramic province” in north-eastern Bactria?

08 FOCUSED ON TRIANGLES AND CIRCLES: SOME PECULIARITIES OF THE INCISED POTTERY DECORATION OF THE HELLENISTIC PERIOD IN CENTRAL ASIA

Author(s): Stanco, Ladislav (Charles University)

Presentation Format: Oral

The pottery traditions of prehistoric Central Asia, with some minor exceptions (as widespread matt painted ware of the Yaz I period, for instance), typically did not feature painted, stamped or relief decoration. Most of the well-studied Bronze Age and Early Iron Age wheel-thrown wares were simple, undecorated. Various decorative techniques on a wider scale were employed for the first time only in the Hellenistic period. While rare relief or mold-made decoration is clearly of the Greek Hellenistic origin (“Megarian bowls” etc.) and was introduced to Bactria only after Alexander the Great, the incised ornamentation, prominent on the later Kushan wares, may have had more complicated background. Among the motives that occur on the Hellenistic pottery of Bactria and adjacent regions, specific geometric patterns – such as triangles, small circles, or both combined – appear, even if rarely. In this paper, various aspects of these specific motives, their origin, semantics, spatial distribution and later use and developments will be addressed. Latest finds show that this type of decoration may help with dating and classification of newly surveyed sites as the Hellenistic ones, especially in those cases, where the most typical forms of the given period are lacking. The hypothesis about such chronological sensitivity of the geometric patterns needs to be further evaluated and verified.

09 CONTINUITIES AND RUPTURES ON POTTERY TECHNOLOGY. FROM THE HELLENISTIC TO THE NOMADIC TRADITIONS IN ANCIENT BACTRIA

Author(s): Martínez Ferreras, Verónica - Angourakis, Andreas - Gurt Esparraguera, Josep Maria (ERAAUB, Department of History and Archaeology, University of Barcelona) - Pidaev, Shakir R. (Institute of Fine Arts, Academy of Sciences of Uzbekistan) - Hein, Anno - Kiklikoglou, Vassilis (Institute of Nanoscience and Nanotechnology, N.C.S.R. Demokritos, Athens)

Presentation Format: Oral

Hellenistic cultural influences spread from the Mediterranean to ancient Bactria (Central Asia) after Alexander the Great’s conquest in the late 4th century B.C. and endured until the invasions of Iranian nomadic peoples, generically the Saka and the Yuezhi, at mid/late-2nd century BC. The pottery produced and used during this period in the settlements located on both sides of the Amu Darya (ancient Oxus River) exhibit certain resemblance with the coeval vessels from the Mediterranean Hellenistic tradition. From the mid/late-2nd century BC, the pottery used in these sites display a varied repertoire that significantly diverges from earlier vessels.

In this multidisciplinary study, we present the archaeological contextualisation and the archaeometric characterisation of tableware and common wares dated in the Seleucid, Greco-Bactrian and Yuezhi periods found at three different sites in northern Bactria: Termez, Kampyr Tepe, and Mirzakultepe. A chrono-typological classification has been established by contextualising the vessels from reliable archaeological stratigraphy and ¹⁴C dating. The analytical program carried out comprises X-ray fluorescence (WD-XRF), X-ray diffraction (XRD), and thin section optical microscopy of the ceramic pastes, as well as the analysis of the coatings by using scanning electron microscopy (SEM-EDS). The study aims to shed new light on the provenance and the technological processes involved in the manufacture of the vessels (the procurement and processing of raw materials, forming, surface treatment, and firing). Our goal is to characterise the pottery technology during the Seleucid and Greco-Bactrian periods and the nomadic occupation, assessing the technological evolution of pottery manufacture during these periods. We expect to detect the influences from the Hellenistic Mediterranean culture, any technological changes brought by nomadic migrations, besides the known morphological variations, and any interaction between the two pottery traditions.

10 THE CERAMIC CONTEXTS FROM MIRZAKZULTEPE (SOUTH UZBEKISTAN) IN THE EARLY KUSHAN PERIOD

Author(s): Pidaev, Shakir R. (Institute of Fine Arts, Academy of Sciences of Uzbekistan)

Presentation Format: Oral

The study presents new data on the ceramic complexes dated to the Early Kushan period recovered during the archaeological excavations at Mirzakultepe, located near Ancient Termez in southern Uzbekistan. The ceramic assemblage comprises all functional categories of vessels (i.e. tableware, common wares, storage jars and cooking pots). The pottery has been contextualised and dated taking into consideration their location on the site and the coins and artefacts associated with. In addition, a detailed description of the shape, the technological characteristics and the decorative patterns of the most common vessels has been performed. Based on these data, a chrono-typological classification is proposed, emphasizing the local features that characterize pottery at this period in ancient Bactria. Thus, the research carried out contributes to a better understanding of the ceramic assemblages used at Mirzakultepe during the period of the nomadic occupation (Yuezhi/Tocharians) and the early Kushan dynasty. In turn, it provides new data on the human occupation developed in this settlement and its evolution along the period considered. The study will also have important implications for the accurate contextualization of the pottery complexes recovered in other coeval sites in ancient

Bactria, such as Akkurghan, Termez, Dalverzin Tepe, Kampyr Tepe, Zar Tepe, and Khalchayan.

11 KUSHAN AND KUSHANO-SASANIAN POTTERY FROM TCHINGIZ TEPE (TERMEZ, SOUTH UZBEKISTAN). TYPOLOGICAL AND ARCHAOMETRIC APPROACH

Author(s): Ariño, Enrique (University of Salamanca) - Gurt, Josep M. - Martínez-Ferrerías, Verónica (University of Barcelona) - Pidaev, Shakir (Institute of Fine Arts, Academy of Sciences of Uzbekistan)

Presentation Format: Oral

Tchingiz Tepe is a walled enclosure located on the banks of the Amu Darya (ancient Oxus River) in Termez. The study of the stratigraphic sequence combined with ¹⁴C dating allowed the reconstruction of the successive occupations, starting with the building of the defensive wall during the Yuezhi or Early Kushan periods. The site became an important Buddhist place of worship under the Great Kushan rulers, as evidenced by a monumental building located in the centre and various dwellings attached to the inner side of the wall. Pottery production at this period is evidenced at least by one pottery kiln. The site reverted to military use after the Sasanian invasion until its final abandonment in the 5th century AD.

This paper presents the archaeological contextualisation, the typological classification and the archaeometric characterisation of tableware, common wares and cooking pots recovered in recent excavations at Tchingiz Tepe recovered by the Spanish-Uzbek archaeological joint team IPAEB. The aim is to identify the provenance and the main technological processes involved in the pottery manufacture —raw materials procurement and processing, forming, and firing—. The geochemical composition of the pottery sherds and of a set of local clays (used as reference patterns) was determined by X-ray fluorescence (WD-XRF); the mineralogical and petrographic composition was examined by X-ray diffraction (XRD) and thin section optical microscopy (OM), respectively.

The study reveals that the pottery production at Tchingiz Tepe comprised slipped and unslipped tableware and common wares (cups, bowls, plates, platters, basins, jugs, jars, containers and oil lamps). They are quite homogeneous in composition and the technological patterns were highly standardised. Nevertheless, most of the cooking pots used at the site are probably regional imports. These data bear witness to the significance of the city as a pottery production and receptor centre within the Silk Road network.

12 KUSHAN CERAMIC CULTURE IN ITS ARCHAEOLOGICAL COMPLEXITY THROUGH THE FRANCO-UZBEK EXCAVATIONS ON TERMEZ (UZBEKISTAN) AND BALKH (AFGHANISTAN)

Author(s): Houal, Jean-Baptiste (CNRS)

Presentation Format: Oral

The world of Central Asia is made of mountains and plains which created traffic corridors for military conquests as well as migrations. Ceramic culture in these areas is thus the result of two components - nomad and urban - and their continuous juxtaposition. It constitutes, for the Kushan kingdoms, a symbol of these countries where intertwined heritages coming from Bronze Age and Hellenism thanks to the conquest of Alexander the Great and Séleucos, but also from the contributions coming from the Eastern limits of the Chinese world. We will not explain here the astonishing symbiosis of this culture but rather set some chrono-cultural markers starting from the ceramic studies which were carried out from the last excavations on the archaeological sites of Termez (MAFOUZ of Bactriane) and Balkh (Mission of Bactriane), but also from the symbolic cities of this period such as Surk Khotal, Dilberjin, Kampyr Tepe. Another purpose is to understand the limits/borders of the Kushan and Bactrian area within these northernmost, southern and western limits through the latest publications, and to provide analysis elements to better appreciate the interrelationship surrounding this culture. The interest of this study is thus to better define the morphological evolution of ceramics through a diachronic vision of the typology.

13 RENEWAL OF CERAMIC STUDIES IN KABUL AND ITS REGION

Author(s): Houal, Jean-Baptiste (CNRS)

Presentation Format: Oral

During the last ten years, intense archaeological activities have taken place both in the city of Kabul (Afghanistan) and on its outskirts in Mess-Aynak. It presently highlights the development of this region from the 5th c. AD onwards under the impulse of important Buddhist monasteries. This presence of religious establishments was already known by excavations done during the 1930s, but in recent years, the remains of Tepe Narenj and Qol-e-Tut, located on the slopes of Koh-e-Zanbourak (“the mountain of the small wasp”), south of the Kabul citadel, have renewed the problematics of occupation. The importance of the structures in place, often harbouring the remains of colossal bodhisattva, and the discovery of coins dating from the 6th c. AD for the earlier, to the end of the 11th century at least, allow us to establish a chronology of the ceramics produced during this period and to renew our work.

The establishment of this chronology based on clear criteria coming from archaeological elements in place allows us now to rethink the Islamization of this region but also to put back in their context a large number of monasteries formerly excavated, or even recent on the site of the copper mine of Mess Aynak.

14 CERAMICS OF THE MERV OASIS – THE OTHER SIDE

Author(s): Puschnigg, Gabriele (Institut für Iranistik, Österreichische Akademie der Wissenschaften)

Presentation Format: Oral

Most of the analyses of ceramics from the quantified assemblages of more recent excavations at Merv focused on rim fragments. This was necessary to guarantee statistical comparability and coherence, specifically with regard to the chronological focus of inquiries. The present paper, by contrast centers on information from the qualitative study of ceramic fragments from various vessel parts, which have so far been neglected in the analyses, but which provide a detailed glimpse on manufacturing techniques and the production and use of pottery in the Merv oasis from the late Iron Age to the Parthian period. In a selective survey I will present individual samples of pottery, which reveal distinct methods of shaping specific vessel types and producing certain wares using new technologies. The samples serve to illustrate the local development in the pottery production and help to trace underlying networks of knowledge transfer. In view of the singularity of some features in the archaeological record, questions may remain unsolved and new ones will arise. The ultimate aim of this contribution, however, is to make information on the hitherto neglected parts of the assemblages accessible and to broaden the bases for the discussion of ceramics found in the Merv oasis, their technical aspects and cultural background.

15 BUKHARA AND ITS NEIGHBOURHOOD: REASSESSING THE CULTURAL LINKS OF THE OASIS FROM NEW CERAMIC EVIDENCE

Author(s): Bruno, Jacopo (Dipartimento di Studi Storici, Università degli Studi di Torino - UNITO) - Puschnigg, Gabriele (Institut für Iranistik, Österreichische Akademie der Wissenschaften - ÖAW)

Presentation Format: Oral

Ceramic assemblages from the Bukhara oasis show an interesting mix of vessel forms and decorative styles, specifically in pre-Islamic times. Some elements of the table ware show parallels to adjacent regions in the south-west and south-east, including Margiana and Bactria, while others, but particularly also the storage vessels appear to be inspired by the north-west or eastern areas, such as Khoresm and Chach. The use of surface coatings and slip paint proved to be a significant criterion in identifying cultural connections, which gradually change through time, though diverse features are often noticeable simultaneously in assemblages.

Recent excavations by the MAFOUB project at various sites in the Bukhara oasis provide fresh evidence for evaluating the various strains of development in the pottery assemblages from antiquity to the early Islamic period. Using a selection of representative examples, in this paper we will analyse these strains with special regard to technical innovations and potentially contemporaneous occurrences of cultural links to distinct adjacent regions. Which features are adopted and what part of the assemblage is modified? Our diachronic study will highlight continuities and changes in the cultural alliance of the Bukhara oasis and will help to identify its position and role within its Central Asian neighbourhood.

16 MEDIEVAL POTTERY TECHNIQUES AND CRAFTSMEN : SAMARKAND WORKSHOPS A CASE STUDY

Author(s): Simeon, Pierre (CNRS-UMR 8167; Museum für Islamische Kunst)

Presentation Format: Oral

Historians and archaeologists agree that pottery craft from Medieval Central Asia form an important part of the craft sector, essential for urban economy in the Eastern Islamic lands.

Nevertheless craft sector in general and workshops in particular, in Uzbekistan and Northern Iranian regions, are sparsely studied in connection. Recent investigations of the ceramic research group (within the German "Khurasan project 2014-2017") gave me the opportunity to work on the larger corpus of sherds outside Central Asia proper. Circa twenty thousand sherds collected into the Samarkand potters workshop before 1907 are preserved in the Museum für Islamische Kunst (Berlin). Russian bibliography and multidisciplinary study confirms a Sāmānid and Qarakhānid chronology (10-11th century).

The aim of this lecture is to present the most significant results of this investigation, useful for the research community. Thus I will focus on the locally produced types (circa 30 attested by the wasters) which help to discard Nishapur productions (?) and other central Asian regional types (south Kazakhstan, Tashkent...). We will show fabric and glaze characterizations based on our recent archaeometric studies (by XRF, SEM and ICP-AES/MS) and their potential interrelations with regional raw material deposits (clays, quartz sands and metal oxides).

17 ISLAMIC POTTERY FROM ANCIENT TERMEZ. LOCAL PRODUCTIONS AND TRADED ITEMS WITHIN THE SILK ROAD NETWORK

Author(s): Fusaro, Agnese - Gurt Esparraguera, Josep Maria (ERAAUB, Department of History and Archaeology, University of Barcelona) - Pidaev, Shakir R. (Institute of Fine Arts, Academy of Sciences of Uzbekistan) - Martínez Ferreras, Verónica (ERAAUB, Department of History and Archaeology, University of Barcelona)

Presentation Format: Oral

This paper presents the most recent comprehensive archaeological and archaeometric investigation on Islamic pottery from ancient Termez (southern Uzbekistan). Unglazed and glazed vessels were collected during the excavations carried out by the Joint Uzbek-Spanish IPAEB team in 2009. The corpus comprises all functional categories (i.e. fine tableware, storage and kitchen vessels,

cooking pots, and also spherico-conical vessels). They are mainly dated between the 8th/9th and the 13th centuries, although some glazed wares can be attributed to a later period (14th-17th centuries). The study has allowed to define the morphological and stylistic features of the wares found at Termez in comparison with the most important Central Asian ceramic productions. Moreover, the chemical, mineralogical and petrographic analyses through X-ray Fluorescence, X-ray Diffraction and thin-section optical microscopy have contributed to distinguish local productions and imported items, and determine the main technological processes related to their manufacture. The study demonstrates that the pottery workshops located at Termez produced both unglazed and glazed wares; their forms and decorations largely conform to the Central Asian Islamic ceramic horizon, showing closer relationships with the southern and eastern areas (e.g. Nishapur, Balkh, Hulbuk), but also with major northern centres, such as Bukhara and Samarqand. The high quality of some unglazed wares and the variety of the glazed production testify the high technological skills of the local potters. The main differences detected within the ceramic manufacture of Termez are related to changes in technology and fashion, occurring especially from the late 12th century onwards. Moreover, the presence of high quality imported vessels coming from distant western lands, along with less luxurious items from more adjacent regions, reveals that Termez had been closely integrated into the main Central Asian trade networks since the Samanid period, being one of the most important centres along the Silk Road.

18 AT THE CROSSROADS OF DATA. PRESENTING THE CAMOTECCER RELATIONAL DATABASE OF ARCHAEOLOGICAL CERAMICS FROM CENTRAL ASIA

Author(s): Angourakis, Andreas - Martínez Ferreras, Verónica - Gurt Esparraguera, Josep M. (ERAAUB, Department of History and Archaeology, University of Barcelona) - Ariño Gil, Enrique (Department of Prehistory, Ancient History and Archaeology, University of Salamanca) - Pidaev, Shakir R. (Institute of Fine Arts, Academy of Sciences of Uzbekistan)

Presentation Format: Oral

We present the structure and current state of the relational database developed during the CAMOTECCER project (HAR2012-32653, 2013-17). This database integrates archaeological and archaeometric data of more than 700 ceramic individuals from several sites in the Surkhan Darya region (ancient northern Bactria), Uzbekistan dated from the Hellenistic to the Islamic period. It documents an individual sample in space (site, sector, and context or stratigraphic unit) and time (through the context dating), being flexible enough to accept different levels of certainty and precision of the archaeological information available. For instance, sites can be located by both geographical coordinates and regional-to-local recursive subdivisions (i.e., Uzbekistan, Surkhan Darya region, South Surkhan Darya region, Bas Surkhan, Termez). To the date, we considered three types of archaeometric data: (a) geochemical composition given by X-ray fluorescence (XRF); (b) petrographic (thin-section microscopy) and mineralogical (X-ray diffraction or XRD) composition and structure; and (d) measurements and classification regarding the shape of ceramic individuals. The four types of archaeometric data can be registered independently but remain connected, to each other and archaeological data, through the unique reference of ceramic individuals.

We illustrate with different case studies (ceramics from Termez, Kampyr Tepe, Mirzakultepe, and Zar Tepe) the possible applications of this database structure for the study of archaeological ceramics. More concretely, this example shows a comparison of statistical analyses of geochemical and petrographic data, separately and together, aiming to detect systematic differences between pottery productions along the period considered.

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PERSPECTIVES OF THE MARIE SKŁODOWSKA-CURIE FELLOWS IN THE ARCHAEOLOGICAL AND CULTURAL HERITAGE FIELDS

Theme: Theories and methods in archaeological sciences

Organisers: Bellia, Angela (National Research Council. Institute for Archaeological and Monumental Heritage) - Schulz Paulsson, Bettina (University of Gothenburg)

Format: Discussion session

The Marie Curie Alumni Association (MCAA) is an international organisation based in Brussels, with representatives all over the world, via a growing number of local chapters. Several Working Groups allow interested members to contribute to important aspects of the development of the association, and the furthering of members' interests.

Joining the MCAA is potentially very beneficial for a researcher's career. The MCAA already has over 10,000 registered members. The overall objective of our participation in the conference in Barcelona is to reinforce the network of this particular community of MCAA fellows: it is significantly dynamic and powerful in terms of intellectual ambition and practical relevance. Many of these alumni are archaeologists and members of the EAA. The MCAA plans to become a focal point for these fellows (past and present).

In this vein, this meeting will be an opportunity to share good practice and to encourage debate on past and on-going experiences in the archaeological field, and to promote debate, research and the exchange of good practices on the quality of conservation, safeguarding, innovative reuse and enhancement of cultural heritage, and on contemporary interventions in the historical environment.

Our MCAA panel will aim to highlight how the Marie Skłodowska-Curie Fellowships are contributing to the development of the MSCA researchers and their future perspectives in the archaeological and cultural heritage fields. In addition, this round table will aim to discuss the current

ABSTRACTS

01 THE MCAA ARCHAEOLOGY AND HERITAGE INTEREST GROUP: A RESOURCE FOR EUROPE?

Author(s): Dawson, Helen (Topoi Excellence Cluster, Freie Universität Berlin)

Presentation Format: Oral

The MCAA Archaeology and Heritage Interest Group was set up in 2015 by MCAA member Helen Dawson upon completing her Marie Curie – COFUND fellowship (2013-2015) at the Topoi Excellence Cluster, at the Freie Universität Berlin. The aim of the group, which has been growing steadily and to date has 34 members, is to bring together fellows working on or with an interest in archaeology and/or cultural heritage. We primarily use the group via the MCAA web platform, to showcase our research as well as to network, share our experiences, and disseminate information about projects and upcoming events. In February 2018, a few of our members met in person at the MCAA General Assembly in Leuven, which provided a real opportunity to take stock and think about future directions for the group. Our range of expertise as a select group of archaeology and heritage researchers places us in a unique position to comment and provide feedback on important issues, such as the European Year of Cultural Heritage 2018. How can we, as members of the MCAA Archaeology and Heritage group, actively promote cultural heritage within society and contribute to cultural diversity and intercultural dialogue? What feedback can we offer to official bodies responsible for promoting heritage across Europe? After a brief presentation of these key questions, I will open the discussion to the audience with the aim of finding out members' ideas and expectations with regards to the group and its role, both in the short and the long run.

02 THE SYMBOL AND STONE PROJECT: A MARIE SKŁODOWSKA-CURIE INDIVIDUAL FELLOWSHIP (CAR) IN ARCHAEOLOGY AT THE UNIVERSITY OF GOTHENBURG

Author(s): Schulz Paulsson, Bettina (University of Gothenburg)

Presentation Format: Oral

In autumn 2016, I was appointed to the Department of History in Gothenburg as a Marie Skłodowska-Curie Research Fellow, funded under the EC's Horizon 2020 Research and Innovation Initiative. The fellowship is related to the Career Restart Panel (CAR), a multidisciplinary panel of the European fellowships which provides financial support to individual researchers who want to resume research in Europe after a career break (e.g. after parental leave, working outside research etc.).

My project "Symbol and Stone" is a comparative study of the megalithic art in Europe and aims to analyze and explain how inter-cultural exchange between prehistoric societies (4500-2500 cal BC) shaped megalithic art, and to theorize and interpret the significance and function of these images. At my host institution I receive both the required specific training for my research topic and long-term academic career training. The project includes two fieldtrips to Brittany and Andalusia and I went through an intensive training in documenting rock art at the Swedish Rock Art Research Archive (SHFA), which is connected to the University of Gothenburg. Beside that, focus is on hands-on training in preparing funding applications for research projects at national and EU level, competence on project management strategies and leadership for advancing collaborative work environments in the academic world.

In this paper, I will briefly present the project and provide insights into the trainings activities, hosting arrangements, dissemination and public outreach strategies of a current Marie Skłodowska-Curie project.

03 A SUSTAINABLE ARCHAEOLOGICAL APPROACH TO THE STUDY OF THE BUILT HERITAGE. THE EXPERIENCE OF THE ACTECH PROJECT IN NORTHERN JORDAN

Author(s): Gilento, Piero (Université Paris 1 Panthéon-Sorbonne)

Presentation Format: Oral

The paper intends to present the experience of an archaeological research in Jordan (the Jordan Hawrân Archaeological Survey) in the framework of the ACTECH project, founded by a MSC-IF. Thanks to this funding it was possible to continue and expand a first research started in 2009 (and concluded in 2012) in northern Jordan, an area of great archaeological and architectural value, although still not well known.

On the one hand, the new project offers the possibility of continuing the study of ancient architecture in the transitional phase from the Late-Antiquity to the early Middle Ages, on the other, returning to the sites after five years, has allowed to record many differences in the state of conservation of the remains. Indeed, clandestine excavations have increased exponentially and many buildings have extensive collapses or are in critical static conditions, almost always due to human factors.

Therefore, the contribution aims to reflect on the practices to be adopted to contribute not only to a better knowledge of the sites, but also to its conservation and enhancement, with a view that cultural heritage can contribute to the development of the small local communities. These are increasingly aware of their past and for this reason it is necessary that they be informed and involved in the research activities. In this perspective it is necessary to act in the contingent situation by recording as much information as possible, producing archaeological records that can be both useful today and usable in the future.

In this regard, it is essential to integrate the use of previous available material with the current one, generated thanks to faster and

more effective technologies. With this documentation it is also possible to check and update the conservation status of the site's material structure and propose the main and most urgent consolidation works.

04 THE ARCHAEOLOGY OF SOUND OF THE CULTIC THEATRE IN A GREEK CITY IN SICILY

Author(s): Bellia, Angela (Institute for Archaeological and Monumental Heritage, National Research Council; Marie Curie Alumni Association)

Presentation Format: Oral

Through this project I aim to assess and recover the lost intangible heritage of cultic theatre acoustics through the acoustic reconstruction of spaces of the past. The acoustics of linear and non-circular theatra in the Greek world have never before been analysed in terms of how and why these spaces were chosen for performance. The project will establish a new line of research at the crossroads of archaeomusicology, architecture, acoustics, and digital technologies to complete a study on these buildings, and will include a specific case study in Sicily. The acoustic reconstruction will also include audio material based on auralisations of ancient instruments.

Through this project I will be able to expand my skills in the use of post-processing software and acoustic techniques based on computerised models. This Marie Skłodowska-Curie fellowship stresses my aspiration to develop new skills in digital heritage. The skills will be extremely useful for my return and reintegration into a longer-term research position in Italy, a nation that is well established in the fields of cultural and digital heritage studies. Securing the Marie Skłodowska-Curie fellowship will be an important step in my career as an expert researcher with an original profile that blends archaeomusicology and digital heritage.

05 GLOBALISATION, MOBILITY, MULTIPLE MIGRATION AND CULTURAL HERITAGE

Author(s): Colomer, Laia (Linnaeus university)

Presentation Format: Oral

Between September 2015 and August 2017, I have been a Marie Curie fellow (Individual Fellowship) with a project called "Cross-cultural heritage. Understanding cultural heritage in a globalized world – ATCK-HER" (Grant agreement No. 658760). ATCK-HER project is a pioneering study in critical heritage aiming to understand the significance and use of heritage and cultural identity in a globalized world. Cross-cultural heritage has been defined in my research as the heritage that is meaningful to people with cross-cultural life experiences, i.e. people who in their lives have been immersed in several cultural environments as a direct or indirect result of mobility, and consequently who amalgamate different cultural identities into something new. My research has revealed that these migrants both use common forms of heritage as a cultural capital to crisscross cultures, and designate places of mobility to recall collective memories. These results pose additional questions to the traditional use of heritage, and suggest others visions of heritage today, as people's cultural identities turn to be now more characterized by mobility, cultural flux, and belonging to horizontal networks.

I will present this timely research topic, what has been done during the MSCA fellowship and how I aim to continue it. The session will also be the perfect place to share my experience as MSCA fellow, including advantages and misfortunes.

322 THE ORIGINS OF SOUND-MAKING, SINGING AND MUSIC. THE ARCHAEOACOUSTICS OF EARLY HUMANS

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Lindstrom, Torill Christine (University of Bergen, Dept of Psychosocial Science; University of Bergen, SapienCE, Centre for early Sapiens Behaviour, CoE) - Zubrow, Ezra (University at Buffalo; University of Toronto)

Format: Regular session

Archaeoacoustics is the archaeology of sound. It encompasses ancient soundscapes, acoustic properties of ancient sites, ancient music, singing and instruments, and various uses of sounds, singing and music in social, political, religious, and other contexts. In this session the presentations should focus on evidence-based archaeoacoustic studies. They are not limited to archaeological sites, but should present data that are connected to relevant theories, and the appropriate use of ethnographic or anthropological analogies. The range of available sound- or music-making instruments have varied through time and across cultures, implying that the sounds and the music produced have been very varied. And, the techniques for vocal sound-making, such as various kinds of singing and chanting also have had a great range of variations. In general, there seems to be a common fascination for sound-making, singing and music that is typical (although not exclusive) for human beings. To explore the origins of sound-making/singing/music is a challenge for archaeoacoustics. This session invites contributions that explore the possible origins of sound-making, singing and music; and contributions that explore their possible functions in early human groups and societies.

01 THE DEMOGRAPHY OF PREHISTORIC MUSIC

Author(s): Zubrow, Ezra (University at Buffalo; University of Toronto)

Presentation Format: Oral

This paper examines the demography of prehistoric music. It makes estimates of the number, age, and gender of prehistoric musicians. The estimates are made with ethnographic, historic, and prehistoric data. Methodologically simulation, interpolation, and extrapolation procedures are used to analyze the data. Even if the results are speculative, the changing demography of music raises interesting questions.

Not only is music pervasive and increasingly so in western societies, it appears that all modern and ethnographic societies have music. It takes a wide range of forms from entertainment to games, from dancing to work; from healing to battle; and from rites to ceremonies. Music provides identity, communication, and symbols as well as a tool for politics and salesmanship. Instrumentation is vast. Presently, there are almost 60,000 different types of instruments known. Of which wind instruments dominate at 39%, percussion at 28% and strings at 22%. Other types make up far smaller percentages. Whether musical and instrumental diversity, ontology, and phylogeny are related is an open question. But clearly the diversity substantiates a long history and prehistory.

Why in some periods and in some areas do the numbers of people doing music increase or decrease? Why are there shifting patterns of the age and gender of the musicians? Are there long-term trends? Are the numbers of musicians (calculated as a percentage of the total population) increasing since the Iron Age - since the Neolithic? Are there catastrophic drops in the musical population? Are these caused by internal or external factors?

Preliminary evidence indicates that the percentage of the musicians within a population has been declining from approximately 30% in the Paleolithic to less than 2% in the historic and modern periods with occasional rises and falls determined by temporal period and location.

02 AMUSING MUSICAL SIMILARITIES: EARLY HUMAN AND MODERN HUMAN SOUND-MAKING, SINGING AND MUSIC. A CASE FOR HUMAN NATURE

Author(s): Lindstrom, Torill Christine (University of Bergen, Dept of Psychosocial Science, University of Bergen, Sapientia, Centre for early Sapiens Behaviour, CoE)

Presentation Format: Oral

We tend to think of the lives of early humans as being profoundly different from ours. This depends on how we define "different". Whether one finds suitable materials and makes arrows and fish-hooks, go hunting and fishing and cooks on an open fire; or finds a suitable job, works & gets paid, shop meat and fish and cook on an electric stove, the similarities strike me. Different from animals' hunting and fishing using their own bodies and consuming their food un-manipulated, humans do a lot of preparations making and using objects/artefacts and manipulate their bodies in order to procure and process their food. - Similarly, animals (including birds and insects) use their bodies directly when making their sounds; whereas humans, apart from spontaneous vocalizations of various kinds, do a lot of preparations making and using objects/artefacts and manipulating their bodies in order to make sounds, singing and music. - We can never know what the sounds, singing and music of early humans sounded like, but good guesses are that they copied sounds from nature (perhaps particularly those of birds), rhythmic sounds (heart beats, sexual movements), and that they might have used sticks and stones on other sticks and stones (including stalactites and stalagmites in caves). - Amusingly, to some extent, humans have not changed in this respect. Modern people still like these things in their music: Animal-like sounds, rhythms of heart beats, heart beats under sexual arousal and sexual rhythms. Examples presented are: Walls (Ruben), Tech House & Techno Mix 2015, Best of Oldschool Techno & Hands Up Music Mix 2017, Duetto para dos Gatos- Duet for Two Cats (Rossini), Cu Cu Ru Cu Cu Pal-oma (Harry Belafonte), Kuckucks-Jodler (Margret Almer), "Flight of the Bumblebee" (Rimsky-Korsakov), Mexican whistler (Wittaker).

03 THE EARLIEST MUSICAL INSTRUMENTS: SEA-SHELLS AS RATTLES IN MIDDLE PALEOLITHIC RITES OF PASSAGE

Author(s): Garfinkel, Yosef (Hebrew University of Jerusalem)

Presentation Format: Oral

Around 100,000 years ago, humans were buried in Skhul Cave in the Carmel mountain range. Some of the burials included red ochre, sea-shells, or a large boar mandible. Around 90,000 years ago, burials took place in Qafzeh Cave in Galilee. These burials, and nearby archaeological levels, were associated with red ochre and imported sea-shells. The Middle Palaeolithic burials of anatomical modern humans point to awareness of death. But burials indicate much more than this: they show awareness of the entire life cycle of birth, initiation, establishing a family and, finally, death. These are the main stages of rites of passage, rituals performed by all human societies worldwide.

What were the main activities involved in these early rites of passage? Ethnographic observations clearly show that dance is a major mode of social interaction in hunter-gatherer communities, whose members live in small groups and practice a nomadic way of life. In the same way, dance must have been a prime form of human behaviour in prehistory.

While burials, beads and red ochre do not seem to be connected functionally, dance ties them together. The most characteristic features of traditional ceremonies are richness in dress, colours, body ornaments, music, movement, exotic items and the like. In this context, when shells are strung together as a bracelet and tied around the dancer's ankles, they become rattles. In this way the personal ornament (sea-shells) becomes a musical instrument, and the origin of musical instruments is thus connected to Middle Palaeolithic dancing. Up to now scholars have considered the flute the earliest preserved musical device. However, simple sea-shell rattles are probably the earliest preserved musical device. The social performance of dance and music started together, embedded in both rhythmic expression of emotions and extensive use in rituals.

04 SHAKING THE RATTLE: THE MAGIC POWER OF SOUNDS IN THE RELIGIOUS AND EVERYDAY LIFE OF THE CUCUTENI-TRYPILLIA CIVILIZATION COMMUNITIES

Author(s): Turcanu, Senica (Moldavia's History Museum within "Moldova" National Museum Complex of Iasi)

Presentation Format: Oral

Although there are not very numerous, the rattle-type finds are a constant presence in various civilizations, throughout the world, within the archaeological inventory, since the Early Neolithic. There were special studies conducted, utilizing both the context of the find and the mythological, iconographical, ethno-archaeological and anthropological sources, that indicate a variety of uses for such artifacts, with multiple, often symbolic, meanings.

The finds of such artifacts in the area of Cucuteni – Trypillia civilization have not received, until now, special attention. Therefore, this presentation attempts, first of all, the systematization of all types of fired clay rattles uncovered in the area of the reference cultural complex. The primary types that were identified show a varied typology that associates the rattling balls with zoomorphic, anthropomorphic shapes or even with items that belong to the everyday household activities.

Enriching the power of the sound and allowing a sensorial approach on the universe of Cucuteni - Trypillia, the rattles identified so far have different sound characteristic, as pitch value, length, quality and intensity, a situation that allows us to hypothesize several directions of functional and symbolic interpretation of such artifacts, by analogy, even without the possibility of contextual analyses. Have these items been used for ritual purposes, in magic dances or in shamanic practices? Had such items apotropaic functions, calling the protection of supernatural powers, or driving away evil spirits and powers of darkness? Were these musical instruments or children's toys? These are the main questions to which the presentation endeavors to give an answer.

05 THE CONTRIBUTION OF ROCK ART FOR UNDERSTANDING THE ORIGINS OF MUSIC

Author(s): Coimbra, Fernando (Polytechnic Institute of Tomar; Geosciences Centre)

Presentation Format: Oral

For several researchers, music has its origins in the Upper Palaeolithic, based in the existence of bone flutes, lithophones and idiophones, among other "making sound objects". However, it's necessary to distinguish "sound" from "music" (which generally requires elements such as rhythm, melody and harmony), despite the idea of music can vary from context to context and from individual to individual.

Rock art is a very important source for understanding the origins of music, since the depicted iconography shows images from ancient worlds as ancient people observed them. Indeed, this kind of art displays examples of musical instruments made of perish materials, which disappear with time, not being present in the archaeological record, constituting therefore important documents for understanding the origins of music.

Besides depicting musical instruments, there are several examples of rock art that represent dancing scenes, which probably were the result of hearing certain kinds of sounds, such as drumming or even more complex music.

The author analyzes several images of musical instruments and dancing scenes depicted in rock art, with different chronologies and from different parts of the world, trying, this way, to contribute for the elaboration of a typology of such instruments and for a better understanding how music in Prehistory and Protohistory could have been like.

06 AN ANIMIST MODEL FOR THE ORIGINS OF ARTS: SPRAYING COLOURS AND BLOWING AEROPHONES

Author(s): Gheorghiu, Dragos (Doctoral School, NUA)

Presentation Format: Oral

The existence of a relationship between the Palaeolithic painted caves imagery and acoustics was suggested through experiments carried in front of the paintings (see Reznikoff 1987; 2002; 2010).

In the perspective of a common animistic origin for music and the visual arts the paper tries to present a common animist symbolism of the two artistic modes, comparing the spraying technique of painting hands and animal bodies with the use of aerophones like bone flutes.

In both cases the art product is the result of a similar act of air or pigment blowing of the performer, who transfers his/her breath to an image or a series of sounds. The relationship of images and sounds through the agency of the human body is also supported by a series of experiments of the acoustic effects of the different techniques of engraving or drawing used in the Palaeolithic visual representations, such as finger fluting or drawing.

Another animistic way of producing images and sounds was percussion, an acoustic technique that transferred the human gesture into the materiality of the stone during the process of producing petroglyphs.

An additional series of acoustic experiments would reproduce the sounds and rhythms of drawing of different operations of stone engraving.

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INHUMATIONS AND CEMETERIES DURING THE NEOLITHIC: A COMPARATIVE APPROACH FROM CENTRAL TO THE SOUTH OF EUROPE

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Bickle, Penny (University of York) - Gibaja Bao, Juan (Spanish Research Council - IMF-CSIC) - Eulàlia Subirà, Maria (Universitat Autònoma de Barcelona)

Format: Regular session

Funerary practices in the Neolithic show great variability, both within and between different regions of Europe, including inhumations, cremations, collective burials and disarticulation. Yet, there are also many similarities of practice shared across the continent. While the collective burials of the Atlantic façade and Northern Europe have been considered alongside each other as a cohesive phenomenon, practices of inhumation in single (or multiple) graves in cemeteries are rarely compared between broader regions at this time. This may be because of their familiarity, as inhumation in cemeteries is widely practiced in modern Europe. We would like to problematize the assumption that inhumation in cemeteries can be taken for granted. In addition, recent developments in archaeological science (e.g. a DNA, isotopes, dental calculus, radiocarbon dating, material culture studies), have meant that our ability to shed light on Neolithic social identity and organisation through inhumations and cemeteries has dramatically increased. This is particularly the case when large cemeteries can be compared and the results of scientific data integrated with the burial practices, such as orientation, body position and accompanying grave goods. In this session, we take a comparative approach to the inhumation burials found in Neolithic Europe, with a particular focus on those from central and southern regions. We invite submissions focused on Neolithic inhumation burial practices across Europe. Those with a focus on interdisciplinary research or bringing together multiple lines of different evidence are particularly welcome.

ABSTRACTS

01 BETWEEN CENTRAL AND SOUTHERN EUROPE: AN ARCHAEOGENETIC INVESTIGATION OF THE FRENCH NEOLITHIC NECROPOLIS OF GURGY (PARIS BASIN, 5000-4000 BC)

Author(s): Rivollat, Maité (MPI-SHH, Jena; PACEA - Université de Bordeaux) - Deguilloux, Marie-France (PACEA - Université de Bordeaux) - Haak, Wolfgang (MPI-SHH, Jena) - Pemonge, Marie-Hélène - Rottier, Stéphane (PACEA - Université de Bordeaux)

Presentation Format: Oral

Archaeological research has defined two major routes of expansion across Europe: the Danube valley and the Mediterranean Sea. Each of them is characterized by cultural characteristics, including funerary practices. Recent studies on ancient mitochondrial DNA have shown that the two waves of expansion can be genetically differentiated after they had spread from the Near East. Both streams eventually met reaching Western Europe in today's France where they came into contact with local autochthonous hunter-gatherers, creating a complex mosaic pattern of interactions and cultural groups.

The Neolithic necropolis of Gurgy les Noisats (5000-4000 BC) occupies a crucial geographic position in the process of Europe's Neolithisation. Indeed, the site is located in the Paris Basin, within the Danubian area of influence and in the French south-north axis of mobility known later during the Middle Neolithic. These different cultural influences characterize the site, notably visible in the funerary practices with for example different shapes of pit (pits with alcove, container or wattling). Previous paleogenetic analyses carried out on HVR-1 mitochondrial sequences for 55 individuals revealed different lineages present in the Gurgy group: a substantial hunter-gatherer component, as well as farmer components from Central and Southern Europe. Interestingly, maternal lineages could not be correlated with any cultural features on the site. Nor did they shed any light on the chronological or spatial organisation of the necropolis. Instead, these results support a scenario of acculturation of all individuals with distinct maternal ancestries.

Here we will present new genome-wide SNP data from Gurgy necropolis individuals, which allows us to investigate the ancestry composition in more detail. We will compare these new profiles with archaeological and other biological data recently published (isotopes, internal tooth structure) in order to characterize the internal structure of the necropolis and in the light of the bioarchaeological background in the Gurgy individuals.

02 VARIED LIVES, SHARED DEATHS: DIVERSITY IN BURIAL PRACTICES AND BIOARCHAEOLOGICAL EVIDENCE FROM THE LINEARBANDKERAMIK (LBK)

Author(s): Bickle, Penny (University of York) - Tvrdý, Zdeněk (Anthropos Institute, Moravian Museum) - Jarošová, Ivana (Freelancer; Anthropos Institute, Moravian Museum) - Richards, Michael (Simon Fraser University)

Presentation Format: Oral

The funerary archaeology record of the Linearbandkeramik (LBK; 5500–5000 cal BC) is dominated by inhumations in cemeteries, but this is not the sole burial practice recorded for the culture. Cremation, disarticulation and secondary opening of inhumations are all attested to in the evidence. This, in combination with the few correlations between isotope data and burial practices, suggests that a straightforward connection between identity in life and treatment in death may not be drawn for the LBK. How then are we to combine bioarchaeological evidence, which provides information about life, with the burial record, which provides us with information about death? Drawing on multiple bioarchaeological evidence, this paper will explore what we can infer about life and death in the LBK culture, with a view to assessing current models of LBK social organisation.

Specifically, the paper will focus primarily on the cemetery sites of Nitra (Slovakia) and Vedrovice (Czech Republic), though will draw on evidence from across the LBK. It will assess how best to combine different bioarchaeological methods with burial practices, including body position, orientation and grave goods. Isotope data from the LBK lifeways project (2008–2012) and the Vedrovice Bioarchaeology project (2005–2007) will be drawn on, alongside osteological studies and new research on the dental microwear from both cemeteries, carried out by Ivana Jarošová and Zdeněk Tvrdý.

03 “SICKLE MAN” GRAVES IN LESSER POLAND AND THEIR ROLE IN BUILDING A NEW IDENTITY OF LOCAL SOCIETIES AFTER THE LBK

Author(s): Czerniak, Lech - Wąs, Marcin (Institute of Archaeology and Ethnology, University of Gdansk)

Presentation Format: Oral

In the Late Balkan and Carpathian Basin (Vinča and Tisza cultures) around 4700-4600 cal BC burials of adult males accompanied by ceramic vessels, stone axes and flint sickle inserts occurred. At the settlement of Szegvár-Tűzköves, two clay figurines presenting people: one with a sickle and the other with an axe were found. Both the mentioned graves and corresponding figural representations are a signal of the emergence of a new symbolism connected with social and religious changes that occurred among the societies occupying tells. Lately, similarly dated “Sickle Man” graves have been registered in the vicinity of Cracow (Lesser Poland). The graves occurred in the centre of each of the three neighbouring not large settlements. Each of the graves was the only one within the settlement. All the dead, together with their “rich” equipment, were placed in wooden chambers built inside pits. These objects testify to the distant transmission of new symbols and an exceptional social role of the buried people. According to the authors, the graves played a leading role in building the common identity of local societies in the process of their reintegration after the LBK decline. The aim of the paper will be an analysis of the mentioned graves in the context of residential and ritual development of the settlements, and changes accompanying the formation of the post-LBK societies at the beginning of the 5th millennium BC.

04 UNUSUAL BURIAL FINDING FROM LATE NEOLITHIC SETTLEMENT AREA IN PRAGUE, CZECH REPUBLIC

Author(s): Blažková, Tereza (Charles University, Faculty of Arts)

Presentation Format: Oral

The polycultural site in the Prague district Ruzyně revealed an extensive Late Neolithic settlement area of the Stroke Pottery Culture. This site is significant one, because in addition to the number of common settlement features as longhouses debris and storage pits there was identified a circular ditch enclosure – rondel and there was also found very unusual inhumation finding, a storage pit filled with human bones. The bones were not funerary buried, but thrown into a pit together with pottery and animal bones. The human bones were represented mostly by fragments of skulls. Anthropological analyzes revealed that there were remains of twenty one individuals of different ages, mostly male but also female. Stored bodies were in different stages of decay at the time of storage. Processed ¹⁴C analyzes of human and animal bone samples from this unusual funeral pit and of animal bone samples from surrounding objects date this finding and also show its relation to the settlement area and of the rondel ditches and its spatial disposition. There are not many burial findings from Late Neolithic in Czech Republic. This particular inhumation finding shows the unusual handling of human remains, the reason of which we do not know. It opens up many interpretations of why and how this happened.

05 POWER AND PRESTIGE IN THE MIDDLE COPPER AGE SOCIETY NORTH OF THE CARPATHIANS

Author(s): Wilk, Stanislaw (Jagiellonian University in Krakow, Institute of Archaeology)

Presentation Format: Oral

The aim of this paper is presentation of one newly discovered cemetery (Książnice site 2, in the south-east of Poland) that changed our view of the strength of interactions between the Copper Age civilization of the Carpathian Basin and the areas situated in the north of the Carpathian. Based on the analysis of this largest and the best investigated necropolis of the younger Danubian cultures in the south-east Poland it is possible to show the characteristics of the new social order, inspired by southern cultural patterns. The most important of these are: the concentration of graves in separate cemeteries, the differentiation of burials with regard to sex, the occurrence of indicators of the richest male burials (a copper hatchet, axe, chisel, numerous and selected flint artefacts, espe-

cially retouched blades-daggers) and female burials (copper jewellery), as well as the allocation of a separate area for elite burials (with inhumations and cenotaph) and one for egalitarian burials (with inhumations, cremation and cenotaph). The above-mentioned characteristics, prove that there was a strong influence of the late Bodrogkeresztúr and the Hunyadihalom-Lažňany patterns of social and religious behaviour on the societies living in the south-east of Poland at the turn of the 5th and 4th millennium BC.

06 INHUMATIONS OF A THOUSAND YEARS. THE NEOLITHIC BURIALS OF THE POLGÁR MICRO-REGION (NE HUNGARY) FROM THE PERSPECTIVE OF BIOSOCIAL ARCHAEOLOGY

Author(s): Anders, Alexandra (Institute of Archaeological Sciences, Eötvös Loránd University, Budapest) - Nagy, Emese Gyöngyvér (Déri Museum, Debrecen)

Presentation Format: Oral

Some 350 burials have been uncovered on eight sites in the Polgár area in eastern Hungary, whose dates fall between 5500 and 4500 cal BC. A part of these burials can be assigned to the Middle Neolithic Linearbandkeramik (LBK), another part to the Late Neolithic Tisza-Herpály-Csőszhalom complex. The burials were not deposited in independent formal cemeteries: all were settlement burials. While the burial rite itself conforms to the period's general practice (crouched position, placement on the left or right side), there are nonetheless several subtle differences between individual sites and successive periods, each of which is characterised by individual traits.

Presented here are the diachronic changes traced over a thousand years in the burial rites based on the archaeological and bioarchaeological record. Is there a correlation between a community's burial rite, lifestyle and health conditions? Are there any differences between the lifestyle of men, women and children, and if so, were these expressed in the burial rite? Is there any correlation between the lifestyle and the health condition of individuals who were accorded valuable prestige items such as *Spondylus* and red deer canines?

Presented here are the first findings of a research project, "Neolithic life histories. Bioarchaeological investigations on burials of the Polgár micro region". The project is financed from the NRD Fund (K 124326).

07 NEW EXCAVATIONS IN OLD SITES. LATE NEOLITHIC NECROPOLIS FROM ICLOD, CLUJ COUNTY (ROMANIA)

Author(s): Gligor, Mihai (1 Decembrie 1918 University of Alba Iulia) - Fetcu, Ana (1 Decembrie 1918 University of Alba Iulia) - Bogdan, Doru (1 Decembrie 1918 University of Alba Iulia)

Presentation Format: Oral

The archaeological site from Iclod (Cluj County, Transylvania) is well known due to the Neolithic enclosure and two inhumation necropolises researched during 1973-2002 by Gh. Lazarovici and Z. Maxim. The results of these investigations, partially published, conclusively proved a number of 109 inhumation graves belonging to the Late Neolithic, Iclod cultural group. The deceased were buried in a supine position, flexed, mainly aligned with the head towards North or South.

The aim of our paper is to present the results of the rescue excavations between 2015-2017, lead by a team from „1 Decembrie 1918” University of Alba Iulia, who uncovered a number of 25 inhumation graves belonging to the mentioned period. Related on the previous archaeological discoveries, the new researches were concentrated on the S-E area, in the proximity of the Someş River.

The anthropological analysis of the human remains ascertained the presence of non-adult and adult individuals, the latter represented by both sexes. The youngest individual in the sample was estimated with the age at death at being 3.5 years old and the oldest reaching 55 years old. Regarding the state of health of the analysed sample, the most common paleopathological indicators were concerning dental condition, followed by degenerative joint disease and cribrotic lesions. The grave goods consist of ceramic vessels, lithic artefacts and bone adornments, typical for Iclod group.

08 WHAT ABOUT THE CHILDREN? A CASE FROM THE LATE NEOLITHIC IN SE EUROPE VIEWED IN COMPARATIVE PERSPECTIVE

Author(s): Kogalniceanu, Raluca (Institute of Archaeology, Bucharest) - Simalcsik, Angela (Centre of Anthropological Research, Iasi)

Presentation Format: Oral

The issue of the under-representation of children is well-known for the Neolithic and Copper Age in South-Eastern Europe and not only. But what about the children that ARE represented in the cemetery? We are used to the "body in a grave" representation when we think of human remains in a burial ground. But the situation at the discussed site seems to be quite different. The vast majority of sub-adult remains were found in complexes of disarticulated bones accompanied by other remains such as pottery or disarticulated animal bones or in the archaeological layer. In only a few cases the children were discovered in features that were described as "graves" or the preserved remains (the presence of small bones, such as vertebrae or ribs) seem to indicate such a feature. The issue of voluntary disarticulation will also be raised during the presentation. I will present the situation of sub-adult human remains from the Late Neolithic cemetery at Cernavodă - Columbia D, attributed to the Hamangia culture, a site that was excavated at the middle of the last century but never published. I will also compare the situation encountered at this site with the situation from the contemporary and culturally equal cemetery south of the Danube, at Durankulak, Bulgaria and with the contemporary cemetery north of the Danube, at Cernica, Romania.

09 ANALYSING SOCIAL DISSYMETRIES AMONG SEPULCRES DE FOSSA'S INHUMATIONS

Author(s): Gibaja, Juan (Institució Milà I Fontanals - IMF-CSIC) - Masclans, Alba (Fondation Fyssen Postdoctoral Fellow, UMR 8215) - Morrell, Berta - Duboscq, Stephanie (Universitat Autònoma de Barcelona) - Martín, Araceli (Generalitat de Catalunya) - Subirà, Maria Eulàlia (Universitat Autònoma de Barcelona)

Presentation Format: Oral

The aim of this presentation is to discuss a regional trend in the frame of an Occidental Europe phenomenon that took place during the middle of the 5th millennia cal BC: the generalization of social dissymmetries together with the enrichment and possible increase of political power by certain individuals/groups.

We are going to explore the Neolithic Sepulcres de Fossa's communities (NE of the Iberian Peninsula) by means of an interdisciplinary approach that will include several kind of bioarchaeological analysis as well as radiocarbon, architectural and taphonomic studies. Furthermore, a deep evaluation of the grave goods' composition and meaning will be presented, including the use-wear, raw material and technological analysis results. The main objective of our project "Aproximación a las primeras comunidades neolíticas del NE peninsular a través de sus prácticas funerarias" (Ministerio de Ciencia e Innovación HAR2011- 23149)" was to be able to generate systematically all this information in a way that a reliable and wide data assemblage could be crossed in order to make a contribution to the Sepulcres de Fossa's sociological characterisation.

In this way, we are going to carry out a diachronic and synchronic review of the different ways of representing the growing inequalities among Neolithic communities' burials through the presentation of the most significant sites and funerary practices of the period.

10 NEW DATA ON THE FUNERARY EPISODE OF THE MIDDLE NEOLITHIC I AT CAN SADURNÍ CAVE (BEGUES, BARCELONA)

Author(s): Edo Benaiges, Manuel - Castellana, Concepció - Bardera, Remei - Martínez-Grau, Hector (CIPAG) - Saña, Maria (UAB) - Bergadà, Maria Mercé (SERP-UB) - Antolin, Ferran (IPAS. U.BASEL) - Martínez Rodríguez, Pablo (CIPAG)

Presentation Format: Oral

Can Sadurní Cave (Begues, Barcelona) was used as a multiple burial space during the period between 4450-4150 cal BCE. Previous work focused on the in situ burials found at the site. Corpses in a forced flexed position were found, indicating that they had been deposited in a strongly-tied shroud. The taphonomic processes that took place inside the cave altered the original distribution of most of the burials, leaving only the ones we believe to be the oldest ones in primary position. The rest of the burials were displaced and dispersed across the cave floor and often were accumulated against the northern cave wall.

In this communication, we will present the results of the anthropological analyses of the dispersed human bones and their correlation with the field excavation records regarding their original position. Their study has allowed the anthropological individualisation of some of these dispersed bones and the restitution of the original location of the different individuals in the surface of the cave. This has allowed better characterization of the funerary episode that took place in the cave.

We will use the funerary model defined at Can Sadurní cave as a basis to review other similar and contemporary funerary contexts in Catalonia and Southern France.

11 WAYS OF LIFE AND DEATH IN THE MIDDLE AND LATE NEOLITHIC COMMUNITIES OF THE NORTHEAST OF THE IBERIAN PENINSULA

Author(s): Plasencia Figuerola, Xavier - González Marcén, Paloma (CEPAP-Universitat Autònoma de Barcelona)

Presentation Format: Oral

The archaeological site of the Bòbila Madurell (Sant Quirze del Vallès, Barcelona, Spain), has one of the largest necropolis ascribed to the Cultura de los Sepulcros de Fosa in the middle Neolithic phase of the peninsular northeast (Bòbila Madurell-Can Gambús), where documented 172 burial pits. The characteristics of these burials and the conservation of a large part of them have allowed to establish guidelines of the funeral ritual used during this period by the agricultural communities established in the central region of the Catalan coast, as well as pointing out the relevance of certain materials of exogenous origin within these societies. On the other hand, close to these complex, just two kilometers from the site of Bòbila Madurell, the presence of a collective burial was documented in the shelter of Can Pallàs, attached to the Late Neolithic.

In a context in which the archaeological remains related to socio-economic and productive activities are preserved in a partial and fractional way, especially about the settlements of the final phase of the Neolithic, the practices of the funeral ritual used during both phases suppose a possibility of approaching the patterns of socioeconomic organization and settlement of these societies. Patterns that a priori, show a transition between the ways of life of the fully consolidated agricultural societies of the Middle Neolithic and those that will happen about a millennium later in the Vallès plain.

12 DYING IN THE NEOLITHIC: AN ISOTOPIC AND PALAEOGENETIC ANALYSIS OF A LATE NEOLITHIC MASS GRAVE FROM BARCELONA

Author(s): Fernandez, Eva - DiRenno, Frank (Durham University) - Robinson, Catherine (Liverpool John Moores University) - Towers, Jacqueline (University of Bradford) - Nowell, Geoff (Durham University) - Molist, Miquel (Universitat Autònoma de Barcelona) - Montgomery, Janet (Durham University)

Presentation Format: Oral

The recent excavation of the Late Neolithic mass burial of La Sagrera (Barcelona) raised questions regarding the reason for the mass inhumation and the relationship of this group with contemporaneous populations in the area. A combination of ancient mitochondrial DNA and isotope analysis (Sr, O, C and N) of thirteen individuals has shed light on the provenance and diet of those buried there.

Mitochondrial DNA diversity allowed to rule out the possibility of a mortuary arrangement based on maternal kinship, and pointed out to a genetically diverse community. Strontium isotope analysis revealed a largely local group, with the majority of individuals falling within expected local biosphere values and some with elevated values probably reflecting migration from regions north and east of the site. The $\delta^{18}O_{DW}$ values of this group were significantly lower than expected for coastal Barcelona, almost 3‰ below local modern rainfall estimates. In an attempt to understand the diets of the individuals, bulk and incremental dentine collagen analysis were conducted, revealing two isotopic groups distinguished by age at death. Individuals that died during childhood had elevated $\delta^{15}N$ and $\delta^{13}C$ compared to those that died in adulthood. The elevated values may be the result of stress prior to death and/or increased marine consumption in response to food shortage such as crop failure, as proposed for the Neolithic population in the Shetland Islands (Montgomery et al. 2013). In contrast, the low and flat $\delta^{15}N$ and $\delta^{13}C$ profiles observed in the adults point at a diet dominated by agriculture, as expected from a Late Neolithic population. These results in connection with the absence of skeletal evidence indicative of violence and the apparent lack of biological maternal connection between the tested individuals, suggests the burial may have served the largely local population following an epidemiological or famine event.

13 THE DOLMEN OF “EL PENDÓN” (REINOSO, BURGOS): DEVELOPMENT AND METHODOLOGY OF A RESEARCH PROJECT

Author(s): Tejedor Rodríguez, Cristina (INCIPIIT, CSIC) - Arcusa-Magallón, Héctor (Professional Archaeologist) - Palomino-Lázaro, Ángel (Professional Archaeologist/Proyectos y Propuestas Culturales) - García-Martínez de Lagrán, Íñigo (Department of Prehistory and Archaeology, University of Valladolid) - Negrodo-García, María (Professional Archaeologist/Proyectos y Propuestas Culturales) - Rojo-Guerra, Manuel (Department of Prehistory and Archaeology, University of Valladolid)

Presentation Format: Oral

The Dolmen of “El Pendón”, located in the village of Reinoso (Burgos), is an exceptional site not only for its occupational sequence but also for the singular ritual-funerary practices documented in its ossuary. In this work, the first results of its excavation, still in process, are presented. At first, it was developed simply as a project of enhancement of the monument, because it was thought it was completely destroyed due to its continuous plundering. At the moment when it was realized that the most of the prehistoric levels could be intact, a fieldwork methodology in area and a detailed system of recording suitable for a site with these features were implemented.

The analysis of the evidences has revealed part of the architectural modifications and of the complex rite-funerary practices that were carried out, because of which what was a classic passage grave of large dimensions turned into a monumental milestone of collective identity and memory for the populations of its surrounding. At the moment, two cycles of use have been documented that, waiting for radiocarbon datings, could be placed at the beginning/first half of the IVth millennium cal. BC and the end of the IIIrd millennium cal. BC respectively. These one are characterized by a different funerary management (some bone rearrangements unknown in the Iberian Peninsula have been recorded) as well as by a complex sequence of “deconstructive” practices that changed the image of the megalithic monument completely (dismantling and closure of the corridor and of part of the chamber). Some evidences of possible later reuse phases, that would have taken place around the end of IIIrd-beginning of IIrd millennium cal. BC and would be probably linked to the Bell Beaker phenomenon, have been documented, but its archaeological contexts are very altered by the recurrent plundering of recent times.

14 “BURY ME ON THE MOUNTAIN AND DO NOT HEAP THE GRAVE” ... THE ROCKY OUTCROP BURIAL OF PEÑACALERA (OBEJO, ANDALUSIA)

Author(s): Martínez Sánchez, Rafael (University of Granada) - Bretones García, María Dolores (University of Cordoba) - Vera Rodríguez, Juan Carlos - Martínez Fernández, María José (University of Huelva) - López Flores, Inmaculada (Independent Researcher) - Maroto Benavides, Rosa (University of Granada) - Bermúdez Cano, Rafael (University of Jaén) - Lara Mengual, Gloria M. (University of Cordoba) - Aljama Martínez, Abén (Independent Researcher)

Presentation Format: Oral

Funerary practices of 4th millennium cal BC are characterized in most parts of Iberian Peninsula by the widespread of megalithic architecture, precluding major changes of social structuration fulfilled throughout the Copper Age. At the same time, burial caves are developed in mountainous areas scattered in the whole Iberia, many of the them located in places with a very difficult accessibility. Both funerary scenes are branded by collective contexts, with representation of male and female individuals with wide range of ages

and followed by ceramic and lithic grave goods. As usual in Mediterranean Iberia, organic material with exception of bone remains, are absent in those contexts, located in warm latitudes with a wide thermal and humidity amplitude. In this communication we would present the surprisingly case of Peñacalera site (Obejo-Cordova), a small burial cave located in a prominent rocky outcrop, in the mountain range of Sierra Morena, discovered in 2015 by local cavers. The burial context comprises the skeletal remains of at least six individuals, with pottery vessels and other objects, and showing organic elements with a remarkable preserved condition, such cork plates (*Quercus suber* bark) and some flax textiles fragments. Given the narrowness of this cavity, we consider as possible that human remains, along with some grave goods, were deposited on cork boards after the bodies partial decomposition or desiccation, prior to cover it with rocks.

15 FUNERAL PRACTICES IN LA BELEÑA (CABRA, CORDOVA), A NECROPOLIS OF THE 4TH AND TRANSIT TO THE 3TH MILLENNIUM CAL BC

Author(s): Massieu, María Dolores (La Laguna University) - Santana-Cabrera, Jonathan (Durham University) - Rodríguez-Santos, Francisco Javier (Instituto Internacional de Investigaciones Prehistóricas de Cantabria. Universidad de Cantabria, Gobierno de Cantabria, Santander) - Martín-Socas, Dimas - Caballero-Crespo, Amparo (La Laguna University)

Presentation Format: Oral

This paper presents a first approach to the funeral practices documented in La Beleña (Cabra, Cordova), a Late Neolithic necropolis located in the centre of Andalusia (south of Iberia), and dated between 3345-2886 Cal. BC. During the Late Neolithic and Early Chalcolithic, burials were located in natural caves, megalithic constructions of varied typology, among which the hypogea structures stand out, as well as ditches. These changes and diversity in funeral constructions have been considered a reflection of demographic growing, the process of sedentarization and intensification of social inequality. However, burial practices have not been analyzed systematically to approach these issues, even though it has been very useful to raise these aspects in European Prehistory during the transition from the IV to the III millennium cal. BC. Thanks to an extraordinary preservation conditions, La Beleña offers an excellent opportunity to consider burial practices of this period, since they are funerary structures that, once amortized, were closed and have not been affected by re-use or subsequent disturbances. So far, three excavation campaigns have been carried out (2015-2017), in which four simultaneous burials have been documented in hypogea (rock-cut tomb), excavated in marly limestone substrate and with constructive characteristics differentiated.

Using an archaeothanatological approach, we documented diversification on burial treatment, including pre- and postpositional manipulation, primary and secondary disposals, intentional alteration of mortuary deposits and the particularized treatment of certain anatomical units, as is the case of skulls. Finally, we discuss our results for a better knowledge of the funerary behavior of these populations, establishing a comparative framework with other necropolises of the same periods of southern Iberia.

16 ANTHROPOLOGICAL AND BIOCHEMICAL ANALYSIS FROM THE NEOLITHIC NECROPOLIS OF CAMPO DE HOCKEY (SAN FERNANDO, CÁDIZ, SPAIN)

Author(s): Vijande, Eduardo (University of Cadiz) - Díaz-Zorita, Marta (Institut für Ur-und Frühgeschichte und Archäologie des Mittelalters, Tübingen Universität) - Sánchez-Barba, Lydia (Laboratorio de Antropología. Facultad de Medicina, Universidad de Granada) - Bocherens, Hervé (Institut für Geowissenschaften, Tübingen Universität; Senckenberg Center for Human Evolution and Palaeoenvironment, Tübingen) - Emslie, Steven (University of North Carolina. Department of Biology and Marine Biology) - Escudero-Carrillo, Javier (Institut für Ur-und Frühgeschichte und Archäologie des Mittelalters, Tübingen Universität)

Presentation Format: Oral

The archaeological excavations carried out during 2008 in the archaeological site of Campo de Hockey allowed to record a Neolithic settlement in the southernmost point of Iberia. This settlement included three main areas: the upper, the intermediate and the lower area. At the upper part, two structures interpreted as huts were documented while in the intermediate area five structures interpreted as storage units were recorded and the unique cemetery at the lower area. The singularity of this necropolis is the high amount of burials, where some of them (n=60) were single with a total estimation of individuals (MNI) of 75. 49 out of the 60 graves were individual (representing 82%), 9 double, and 2 containing 4 individuals. Within those graves, there are some differences in the way they were constructed, some of the better built including prestige objects made of exotic material such as sillimanite, variscite, amber, or turquoise. The purpose of this paper is to combine the anthropological (sex & age estimations and the evaluation of health status) with the biochemical information. Results of the biochemical analysis to investigate diet ($\delta^{15}N$ and $\delta^{13}C$), mobility ($^{87}Sr/^{86}Sr$ and $\delta^{18}O$) and total mercury (THg) analysis of the bone are also presented. In addition the new radiocarbon dates (AMS) are presented which are confirming the time span of this necropolis during the 5th-4th millennium BC.

17 EXPLORING THE DIVERSITY OF SOUTHERN PORTUGAL HYPOGEA: FUNERARY PRACTICES OF MONTE CANELAS I AND MONTE DO CARRASCAL 2 COLLECTIVE GRAVES

Author(s): Neves, Maria João (CIAS - Research Centre for Anthropology) - Silva, Ana Maria (CIAS - Centro de Investigação em Antropologia e Saúde - Universidade de Coimbra; Uniarq - Universidade de Lisboa)

Presentation Format: Oral

Occuring at the same time as other funerary monument types, like dolmens or tholoi, the presence of hypogea is well documented in the Portuguese regions of Estremadura, Alentejo and Algarve.

Explored since the XIXth century, this kind of collective grave, encompasses a certain diversity regarding architectural characteristics, number of individuals buried or associated material culture. To understand the roots of this diversity rigorous excavations and site analysis are needed.

In Portugal, the development of rescue archaeology since the 1990s has given the opportunity to recognize and excavate a considerable number of hypogea in the Alentejo and Algarve regions.

In this work we present the results of the archaeoanatomical and GIS analysis of three hypogea: Monte Canelas I (Portimão, Faro) and Hypogeum I and II of Monte do Carrascal 2 (Ferreira do Alentejo, Beja).

Containing large amounts of skeletal remains, the results of the study shows a careful management of the funerary areas, including the human remains. The documentation of the remains allowed to infer the original dispositions of the bodies, and therefore to better characterize the burial practices. This approach was supported by radiocarbon dates and stratigraphic analysis, that permitted to record the biography, periods of construction, use and abandonment of these tombs.

The comparison of the data of these monuments allowed a more accurate knowledge of Neo-Chalcolithic funerary practices in hypogea of southern Portugal. Yet, these have to be complemented with further radiocarbon dates, DNA, mobility and paleodiets (among other archaeological and anthropological) analysis in order to better understand these collective graves and their importance to the Neo-Chalcolithic living community.

a. THE MEGALITHIC MONUMENT OF LAS ARNILLAS (BURGOS, SPAIN): A BIOARCHAEOLOGICAL APPROACH

Author(s): Santa Cruz, Angélica (Universidad de Valladolid)

Presentation Format: Poster

The megalithic monument of Las Arnillas is located in Moradillo de Sedano (north of Burgos Province, Spain). The study of this collective burial is framed within a research project which took place during the 1980's and involved the excavation of a dozen megalithic tombs from Las Loras area. In the particular case of Las Arnillas, the archaeological excavation revealed an important set of human bones which date back to the Late Neolithic (c. 4th millennium cal BCE). The aim of this poster is to present some preliminary results obtained through the bioarchaeological analysis of these human remains. The anthropological study focuses on paleodemographic and taphonomic methodology, which provides significant data to understand the burial practices of these collective graves. Likewise, some paleopathological findings, morphometric data and occupational markers are shown for the purpose of contributing to the knowledge of Late Neolithic populations. It could be confirmed that all the groups of age and sex are not represented in the sample, probably due to selective burial patterns related to megalithic funerary practices. Furthermore, it is pointing out some taphonomic evidence analyzed on remains which suggests that they would have been exposed to natural agents according to the location inside the megalithic grave (chamber / corridor).

b. A LOOK FROM THE BALKANS: THE ENEOLITHIC CEMETERY FROM SULTANA-MALU ROȘU (ROMANIA)

Author(s): Lazar-Radus, Catalin Alexandru (Department of Ancient History, Archaeology and Art History, Faculty of History, University of Bucharest; "Vasile Pârvan" Institute of Archaeology, Romanian Academy) - Balasescu, Adrian ("Vasile Pârvan" Institute of Archaeology, Romanian Academy)

Presentation Format: Poster

The current paper aims to explore the particular aspects of the Eneolithic cemetery from Sultana-Malu Roșu in Romania (ca. 5000-4000 cal. BC). The burial ground is an extramural cemetery typical for Eneolithic communities in the Balkans, with its location in an uninhabited area, not far from the settlement(s). The people from two settlements belonging to two largely chronologically different Eneolithic communities used the same cemetery. During the first phase of activity (c. 5000-4500 cal. BC), the burial ground was used by the Boian communities who lived in the flat settlement of Sultana-Ghetarie, while in the second phase (c. 4500-4000 cal. BC), it was used by the inhabitants of the Gumelnita tell settlement of Sultana- Malu Roșu.

The 99 inhumation graves identified to date were grouped on the terrace edge and along the slopes of Mostiștea Lake. The deceased was laid out in a foetal position on the left side, with an east to west orientation (head to east). Most of the graves from the cemetery were single, primary inhumations within simple, oval pits, without other traces of funerary constructions. Secondary burials and graves with clear evidence for the deliberate removal of certain skeletal elements have also been documented. The grave goods and funerary offerings are also presented in some graves.

Our analysis will focus on the study of funerary rituals, correlated with radiocarbon, zooarchaeological, palaeodemographic, aDNA and isotopic data, doubled by a GIS analysis. The aim of this integrated approach is to identify the symbolic potential of the individuals buried in this cemetery and to gain insights concerning their position within this past society.

This work was supported by a grant of the Romanian Ministry of Research and Innovation, CCCDI – UEFISCDI, project number PN-III-P4-ID-PCE-2016-0676, within PNCDI III.

c. FEATURES WITH HUMAN BONES FROM ȘOIMUȘ-LA AVICOLA (FERMA 2), HUNEDOARA COUNTY

Author(s): Stefan, Cristian-Eduard ("Vasile Pârvan" Institute of Archaeology Romanian Academy)

Presentation Format: Poster

During the construction of A1 Motorway route, the segment located between Deva and Orăștie, a joint team of archaeologists from the "Vasile Pârvan" Institute of Archaeology (Bucharest), Roman and Dacian Civilization Museum (Deva) and Romanian National History Museum (Bucharest) conducted preventive archaeological researches in the settlement of Șoimuș, from 16th August until 16th November 2011. The settlement is positioned in the Șoimuș commune, between this locality and Bălata Village, Hunedoara County, in a place called La Avicola (Ferma 2), on the middle sector of the first terrace of the Mureș river (East-West direction). Based on the preliminary field reports and surveys carried out in the area, the existence of a Neolithic settlement with two main habitation levels attributed to the Vinča and Turdaș traditions was confirmed. In terms of stratigraphy, the first habitation stage corresponded to a settlement with huts, followed by a levelling of the site with a brown-ash sediment observed in the upper part of the infill of many features. The second stage of habitation corresponded to a settlement with surface dwellings and appeared at a depth of 0.40 m. At that depth, a substantial destruction level was observed, consisting of burnt debris scattered all over the surface (some of the daub fragments still bearing wattle traces), hearths and clay floors; below those was a thin layer of gravel, some negative impressions of poles and a large quantity of archaeological material (pottery, bones and lithic items). In this presentation we analyse the human bones found in different features from this settlement belonging to Vinča and Turdaș traditions. We try also to find other similar finds in the Late Neolithic at north of Danube, either in the settlements belonging to Vinča and Turdaș traditions, either in settlements belonging to roughly contemporaneous traditions.

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STRATEGIES OF OBSIDIAN PROCUREMENT, KNAPPING AND USE IN THE FIRST FARMING SOCIETIES FROM THE CAUCASUS TO THE MEDITERRANEAN

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Vinet, Alice (Université Paris 1 - Panthéon Sorbonne; UMR 8215 Trajectoires; UMR 7264 CEPAM) - Guilbeau, Denis (Ministère de la Culture; UMR 7055 Préhistoire et Technologie) - Milić, Bogdana (Institute for Oriental and European Archaeology - OREA, Austrian Academy of Sciences)

Format: Regular session

Since they began in 1960's, obsidian provenance studies have been improved through new analysis and methods of characterisation that have given a rich database output regarding the obsidian sources from Caucasus to Mediterranean. Meanwhile, chipped stone analyses have benefited from the development of technological and functional studies. However it is only relatively recently that progress has been made regarding these methods for use on obsidian as opposed to siliceous rocks, due to its distinctive physical properties. We aim to gather new studies involving innovative approaches in obsidian studies in order to revive the debate on procurement strategies, knapping and use of this predominant raw material.

The geo-chronological frame of this session is intentionally broad, including the first farming societies from the Caucasus to the Mediterranean region, covering the span from the 10th to the 6th mill. BC. These communities shared almost the same kind of lifestyle, in particular, concerning the significance of agriculture and animal breeding. Yet the environmental and cultural background differed in many ways, which has influenced the access to obsidian. We tend to compare, at a large scale, the strategies employed by the farmers to exploit obsidian in different socio-cultural and environmental settings. The session aims to identify the main parameters that conditioned the exploitation of this raw material.

We invite scholars to present their approaches to these archaeological questions, particularly when utilising multidisciplinary methods. Papers presenting case studies are also welcomed. The contributions and the up-to-date discussion will be published in an internationally peer reviewed volume.

ABSTRACTS

01 OBSIDIAN'S MYRIAD ROLES IN CENTRAL MEDITERRANEAN PREHISTORY

Author(s): Freund, Kyle (Indian River State College)

Presentation Format: Oral

This paper focuses on the myriad roles of obsidian within prehistoric farming communities of the central Mediterranean, ranging from a raw material for tool production to a medium regulating social relations and complex power dynamics across space. To date, obsidian has been reported at over 1200 archaeological sites throughout the central Mediterranean, the vast majority coming from four island sources in the region. These raw materials were used to produce a broad range of flake-based tools and pressure-flaked blades beginning in the Neolithic and continuing well into the Bronze Age.

The circulation of obsidian within complex networks of interaction and exchange during the Neolithic served an important social

function. Through an examination of the relative quantities of obsidian across the central Mediterranean land/sea-scape, it is argued that direct procurement and down-the-line exchange characterize the distribution of obsidian near the source areas on the islands of Sardinia, Corsica, and Sicily. However, at archaeological sites farther from the sources, a model of direct procurement and redistribution best fits the data. Despite its ubiquitous presence, obsidian rarely makes up a large percentage of chipped stone assemblages outside of the immediate source areas. When considered in combination with the fact that obsidian is highly brittle and is thus not ideal for carrying out many daily activities, it is argued that these raw materials - and pressure-flaked blades in particular - may have served a distinct social role in practices ranging from hair cutting, shaving, tattooing, piercing, to scarification.

Central to this paper is idea that when lithic data are analyzed within a chaîne opératoire approach combining analyses from multiple stages of artifact life histories, this information represents a powerful means of engaging with major social science questions, where a particular regional data set can be used to contribute to debates of broader archaeological significance.

02 DISTRIBUTION MECHANISMS OF OBSIDIAN IN AEGEAN FROM THE INITIAL NEOLITHIC TO THE EARLY BRONZE AGE (6800-2200 CAL BC)

Author(s): Guilbeau, Denis (Ministère de la Culture; UMR 7055 Préhistoire et Technologie)

Presentation Format: Oral

The aim of this presentation is to explore how obsidian was distributed on the whole Aegean from the start of the Neolithic to the Early Bronze Age. Obsidian from different sources were present during this long period: Melos is by far the most frequent (Adamas and Demenegaki), all the other sources were marginal, whatever period and region considered, for instance Giali obsidian - the only other source in Aegean - but also obsidian from Cappadocia (Göllüdağ and Nenezidağ) and from Carpathians. The frequency of these raw materials varies a lot from a region to another and from a period to another. This reflects the probable diversity of the distribution systems, for instance we can remind the supposed presence of specialized mobile knappers in the southeastern part of Greece up to Thessaly from the late 7th up, while, in the same time, the marginal presence of obsidian in some sites in Northern Aegean is not coherent with such system and must correspond to another providing system, for instance a down-the-line system. These interpretations are based on a study of the chaînes opératoires in each site. For instance, some sites yielded artefacts from almost all the phases of production, while some yielded mainly final products. The products vary too, from flakes, small blades to very large regular pressure blades. Finally, the diversity of distribution mechanisms reflects how the communities during the late prehistory in Aegean were connected.

03 OBSIDIAN AS A TRIGGER FOR SPECIALISED BLADE PRODUCTION IN THE NEOLITHIC OF WESTERN ANATOLIA AND ADJACENT REGIONS

Author(s): Milić, Bogdana (Institute for Oriental and European Archaeology (OREA), Austrian Academy of Sciences)

Presentation Format: Oral

During the Neolithic period in Western Anatolia (7th mill. BC), lithic assemblages are characterised with the presence of obsidian in different proportions, usually concerned as exotica. Small amounts of obsidian from the number of Neolithic sites presumably led to a different use of this raw material in contrast to locally available cherts, visible through the technology of chipped stones and types of aimed products. The data from Neolithic Çukuriçi Höyük in Central-West Anatolia informed about extremely high proportions of obsidian when compared to the contemporaneous sites in the region. Besides, the site gives an insight into an extremely standardised production of pressure blade(let)s and the making of long blades, attested through single specimens and caches. These aspects, accompanied with other elements associated to tiny amounts of debris etc., suggested a specialised production related to blade making existing within the settlement, raising the hypothesis that obsidian triggered such specialised production.

The principal idea for the paper is to address the elements that go alongside specialised production - levels of specialisation, specialised vs. regular household production of chipped stones (1); to use the case of Çukuriçi Höyük to demonstrate on which evidence the conclusions regarding specialised production were based (2) and finally to look at the patterns from other sites in a wider region in order to test the hypothesis (3). Some of the criteria followed in the study are the proximity, i.e. distance of the Neolithic sites from obsidian sources, use of certain techniques in blade production and maintenance of knapping trends through time. Finally, the focus of this paper is the Western Anatolian and Aegean region in the 7th mill. BC, however, the study tends to outline a broader area concerning the sites from the Near Eastern and Anatolian Pre-Pottery (PPN) and Pottery Neolithic periods based on the published data.

04 OBSIDIAN IN THE LEVANT

Author(s): Maeda, Osamu (University of Tsukuba) - Campbell, Stuart - Healey, Elizabeth (University of Manchester)

Presentation Format: Oral

This paper investigates obsidian circulation in the Levant based on the provenance analysis of large numbers of obsidian artefacts from several Levantine sites using a portable XRF instrument. This includes several hundred artefacts recovered from excavations at Domuztepe in southeast Turkey, Tell el-Kerkh in northwest Syria and Jericho in the south Levant, as well as smaller numbers from other sites, which cover a wide time range from the Pre-Pottery Neolithic A to the Early Bronze Age. The geochemical analyses were conducted at the Manchester Obsidian Laboratory (MOL) where we hold a large geochemically sourced reference collection, on which the source attributions are based.

Our results are combined with published data from other Levantine sites in order to consider change and continuity in obsidian circulation through time and space. The analysis of a large proportion of the obsidian artefacts from several assemblages has enabled us to demonstrate subtle changes within the general dominance of obsidian from Central Anatolia in the Levant. Not only does the use of southeast Anatolian obsidian increase through time, but we have also been able to identify the rare occurrences of obsidian from very distant sources.

Reference

Campbell, S. and E. Healey 2016 Multiple Sources: The pXRF Analysis of Obsidian from Kenan Tepe, S.E. Turkey. *Journal of Archaeological Science: Reports* 10: 377–389.

Campbell, S. and E. Healey 2017 Diversity in obsidian use in the prehistoric and early historic Middle East. *Quaternary International*.

05 NETWORKED COMMUNITIES. ACCESS AND CIRCULATION OF OBSIDIAN MATERIALS IN THE SOUTHERN CAUCASUS BETWEEN THE NEOLITHIC AND CHALCOLITHIC

Author(s): Ricci, Andrea (Graduate School „Human Development in Landscapes“) - Palumbi, Giulio (Laboratoire CEPAM, CNRS) - Gratuze, Bernard (Laboratoire IRAMAT, CNRS) - Hansen, Svend (Eurasia Dept., German Archaeological Institute) - Menabde, Medea - Nebieridze, Lamara (Georgian National Museum)

Presentation Format: Oral

The Caucasus is a region extremely rich of natural resources and raw materials. These not only include a variety in mineral resources (e.g. obsidian, copper, lead, silver, gold, and salt), but also an array of other natural resources, including large pasturelands and wild fauna. However, accessing these resources might be a challenge, as they are frequently found in regions located at high elevation, accessible only for part of the year. By combining novel analysis on obsidian fragments from the sites of Sioni and Tsopi with published results of landscape, artefacts, on-site studies (i.e. Aruchlo and other sites), and palaeoecological analyses, this paper will focus, in particular, on the region of southern Georgia and northwestern Azerbaijan in order to investigate changes in obsidian procurement strategies and patterns of obsidian circulation between the Lower Kura Valley and the mountains of the Lesser Caucasus. Specifically, we will concentrate on the evidence for the time comprised between the late Neolithic (6th Mill. BCE) and the Chalcolithic (4th Mill. BCE) Periods. Thus, this study shall unveil the role of technological shifts and socio-economic developments in changes in access and circulation of obsidian as well as in transformation of regional and over regional interactions in the Southern Caucasus.

06 OBSIDIAN PROCUREMENT STRATEGIES AND TECHNOLOGIES IN THE CHALCOLITHIC OF ARMENIA: AN EXAMPLE FROM GETAHOVIT 2 CAVE

Author(s): Tardy, Nicolas (CNRS/Archéorient - UMR 5133) - Kalantaryan, Irene (Archaeological Institute of Erevan) - Perello, Bérangère (CNRS/Archéorient - UMR 5133)

Presentation Format: Oral

Getahovit 2 is a cave discovered in 2010 and situated in the valley of the Khachakhpyur river, in the Tavush region (Northeastern Armenia). The excavation of the cave during 7 years revealed human occupations ranging from the Middle Ages up to the Late Palaeolithic periods.

This paper only focuses on procurement strategies and technologies of lithic artefacts recovered from the Chalcolithic layers, where the cave was mostly used as a sheepfold for transhumant shepherds.

Lithic assemblage from these chalcolithic layers is predominantly made of obsidian originating from 3 obsidian sources in Armenia and a great dichotomy in the technologies used is observed:

The majority of the lithic industry consists of small flakes, cores and chips deriving from simple production techniques such as hard hammer direct percussion and anvil technique on small nodules with cortical residues. The lithic analysis suggests a direct procurement strategy from the obsidian sources in the form of small nodules knapped in the cave itself (opportunistic model).

On the other hand, the presence of a few very regular blades produced using pressure techniques which appear to be imported to the site as finished products raises the question of a totally different procurement strategy probably set through exchanges with neighboring villages located closer to the sources (down the line exchange).

07 FROM FUNCTIONAL TO SYMBOLIC: OBSIDIAN PROCUREMENT, PRODUCTION, CONSUMPTION, AND DEPOSITION PRACTICES AT NEOLITHIC ÇATALHÖYÜK

Author(s): Doyle, Sean (McMaster University)

Presentation Format: Oral

The chipped stone of Neolithic Çatalhöyük in central Anatolia has been a focus of study since archaeologists first discovered the site 60 years ago. The obsidian, in particular, has been the focus of numerous research methodologies not limited to technological, typological, contextual, and chemical characterization studies. These studies have identified both changes and consistencies in obsidian procurement, production, consumption, and deposition practices on multiple spatial and temporal scales.

This paper covers everything from procurement to deposition practices within the site, but its primary purpose is to report on recent spatial analyses of obsidian's functional and symbolic roles within the community of Çatalhöyük. It identifies areas within the site

where obsidian was deposited as a form of minimally worked raw material, where and how it was reduced and worked into tools using different technological production systems, and final deposition patterns. It differentiates areas and levels within the site where particular industries are represented, and where they are not. In short, it discusses the chaîne opératoire of obsidian manipulation from when it entered the site to its ultimate deposition. It reviews the sub-floor caching of obsidian material that has become better understood in recent years, and the apparent ritualized deposition behaviours common to particular types of obsidian objects and stratigraphic contexts within the site. Finally, it identifies areas and levels within the site where distinct modes of obsidian preparation and production occurred.

An ultimate aim is to collate the chipped stone data and renew discussions on the large-scale regional processes that Çatalhöyük was but a part of. The site did not exist in isolation, but was plugged into exchange routes and levels of regional socio-cultural organization that are only recently being discussed.

08 THE EARLY CHALCOLITHIC OBSIDIAN POINTS FROM CENTRAL ANATOLIA

Author(s): Vinet, Alice (Université Paris 1 - Panthéon Sorbonne; UMR 8215 - Trajectoires; UMR 7264 CEPAM)

Presentation Format: Oral

This paper presents the preliminary results of a comparative techno-functional study of a corpus of Anatolian points. The artefacts from two contemporary sites have been examined, mostly the levels attributed to the late Neolithic and the Early Chalcolithic around 6000 BC. Tepeçik Çiftlik is located in Cappadocia, in a close environment from the obsidian sources. It was occupied from the PPN to the Early Chalcolithic. Çatalhöyük-West is situated in the Konya plain. The mound was occupied between c.6100 BC and c.5600 BC. Their situation provides an ideal setting for examining the socio-economic interactions between two communities bound by their use of obsidian.

The results demonstrate different strategies of use. At Çatalhöyük, we see a decrease of the points during the Early Chalcolithic in accordance with the progressive disappearance of hunting as the main mode of subsistence. Distinctive use-wears are also observable on these points which lead us to rethink the function of these “projectiles”.

Whereas, at Tepeçik, we observe an increase of the hunted species at the end of the Neolithic and an abundance of projectiles exhibiting characteristic impact fractures.

This presentation explores the chaîne opératoire of points production, from the procurement of the obsidian at the Cappadocian sources until the rejection of the used points in the houses.

09 OBSIDIAN AS A SOCIAL OBJECT? UNDERSTANDING ‘UNUSUAL’ OBSIDIAN ARTEFACTS IN THE AEGEAN NEOLITHIC

Author(s): Milic, Marina (Independent)

Presentation Format: Oral

Obsidian has long been recognised as a proxy for tracing long-distance interaction and exchange. Its great archaeological value has been its traceability and geographically widespread procurement by ancient communities. Obsidian naturally occurs throughout the Mediterranean which enabled its extensive use in prehistory, particularly by communities living close to sources (e.g. in central Anatolia or the Aegean). Rather than exploring lithics assemblages in which obsidian is utilised as a primary raw material, this paper focuses on small obsidian assemblages that only occasionally and irregularly appear in archaeological contexts. These rare pieces are found in two instances, either as minor components in chipped-stone assemblages dominated by other materials (e.g. flint or chert), or when a rare obsidian type is found within an assemblage dominated by other specific sources.

Such a small quantities have tempted us to view these objects as ‘exotic’ and a part of special social phenomena rather than minor components in ordinary exchange networks. As a marker of communication, the value of obsidian in these distant contexts is not technological and utilitarian (economic) but is more closely linked to ‘symbolic’ purposes that involve journey contacts and activities (e.g. travel tokens of specialists). This paper discusses a number of unusual / ‘rare’ obsidian groups that were identified through a systematic analysis of several sites in the eastern and northern Aegean, using a portable XRF instrument. Their origin is examined in tandem with the techno-typological characteristics allowing better understanding of the ‘exoticness’ of artefacts particularly in the regions where its procurement and consumption are generally common. The paper is exploring to what extent the rarity and visual identity of these artefacts allow us to define them as ‘characterful’ objects and how their traceability helps us to understand certain processes and events.

10 CAUSE FOR REFLECTION: OBSIDIAN “MIRRORS” IN THE NEAR EAST

Author(s): Coskunsu, Güner (Centro Internazionale di Sperimentazione, di Documentazione e di Studio per la Preistoria e l'Etnografia dei Popoli Primitivi) - Healey, Elizabeth (The University of Manchester Archaeology Department) - Iovino, Maria Rosa (Centro Internazionale di Sperimentazione, di Documentazione e di Studio per la Preistoria e l'Etnografia dei Popoli Primitivi)

Presentation Format: Oral

Obsidian “mirrors” feature among the more striking, rare and awe inspiring objects found in some Neolithic assemblages in the Near East. These “mirrors” are very distinctive in that they have a highly reflective planar or slightly convex surface on circular or sub-circular pieces of obsidian, though the form of the support may vary. The time and energy invested in the abrading and polishing

processes to achieve this highly reflective surface clearly demonstrates that the objects were valued and of importance to their owners; it is the nature of this surface that has caused archaeologists to conceptualize these objects as mirrors, although there is no direct evidence for their actual function. Indeed, ethnographic and other studies indicate that mirror use in some cultures was complex and that an understanding of their purpose cannot be reached from the presence of a single attribute, namely the polished surface.

We are thus skeptical about the identification and function of these objects as mirrors; we have therefore designed a research project that will open up avenues which will lead to an understanding of whether these objects were mirrors (*sensu stricto*), or whether they were something else altogether.

In this presentation we will summarise the preliminary results of our project which examines these objects from a number of different perspectives (rather than depending on preconceived ideas about the purpose of a polished surface) to see if we can get some insight into their purpose. Our methodology involves multi-disciplinary approaches including a re-examination of the life-histories of the archaeological mirrors through typological, contextual, experimental and, where possible, use-wear analysis. We are also experimenting with various objective measurements to measure the reflectivity of the polished surfaces (e.g. SPA and roughness, RI and GRIM).

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PAVING THE WAY FOR ARCHAEOLOGICALLY INFORMED PALAEO-POPULATION GENETICS: INCORPORATING ARCHAEOLOGICAL INFORMATION IN PALEOGENOMIC RESEARCH, AND VICE VERSA

Theme: Theories and methods in archaeological sciences

Organisers: Hofmanová, Zuzana (University of Fribourg) - Burger, Joachim (Johannes Gutenberg University Mainz)

Format: Regular session

Paleogenomic data are produced at an ever faster rate and with unprecedented quality due to methodological and technological improvements. As a result, paleogenomic inference is addressing archaeological questions spanning a large range of periods and geographic regions. Recently, various ancient DNA studies clarified large, continental ancestry issues, particularly in humans. In many cases, this has led to spectacular findings, although rather anthropological than historical in nature. The actual (pre)historical questions and the available detailed archaeological knowledge sometimes remained in the background. The aim of this session is to identify ways how palaeogenomic inference can be used to identify demographic processes at the level of regions, settlements, clans, and families by fully profiting from the available archaeological knowledge and the informational content of ancient genomes. This probably can not be done on a descriptive level alone and requires advanced statistical inference or demographic modeling techniques, ideally on the basis of full ancient genomes. Especially when dealing with closely related populations and complex demographies, this endeavor is not trivial and requires more effort than the de rigueur techniques of statistical genomics. For this session, we thus welcome papers that present methodological and statistical advances towards this goal and that demonstrate how these new approaches are better suited to integrate archaeological questions and genomic inference than conventional ones. We hope to discuss future prospects how the fields can further converge. Therefore, we invite researchers from both fields to bring in ideas how to combine genomic and archaeological information in one coherent framework.

ABSTRACTS

01 NOVEL STATISTICAL TOOLS BRING TO LIGHT COMPLEX INTERACTIONS DURING PREHISTORIC DEMOGRAPHIC TURNS: THE CASE OF LEPENSKI VIR

Author(s): Hofmanová, Zuzana - Link, Vivian - Schulz, Ilektra (Department of Biology, University of Fribourg; Swiss Institute of Bioinformatics, Fribourg) - Bloecher, Jens - Winkelbach, Laura (Palaeogenetics Group, Institute of Organismic and Molecular Evolution - iOME, JGU Mainz - Stefanović, Sofija (Laboratory for Bioarchaeology, Faculty of Philosophy, University of Belgrade) - Burger, Joachim (Palaeogenetics Group, Institute of Organismic and Molecular Evolution - iOME, JGU Mainz) - Wegmann, Daniel (Department of Biology, University of Fribourg; Swiss Institute of Bioinformatics, Fribourg)

Presentation Format: Oral

Availability of palaeogenomic information depends on the survival of ancient DNA (aDNA) in human remains. Therefore, studies often include only a limited number of individuals or rely on pre-selected genomic sites that restrict further analysis and do not utilize full information potential of the samples despite destructive aDNA sampling. While this is changing with the availability of whole genome sequencing, aDNA analysis is still easily influenced by contamination, poor DNA preservation, sequencing errors and reference bias. Incorporating these uncertainties directly to the analysis through genotype likelihoods results in increased power and accuracy for population genetic inferences.

Our suite of statistical tools, ATLAS, enables users to build complete customised analysis pipelines, takes into account diverse sources of error and accurately estimates genotype likelihoods and allele frequency spectra to be further used in explicit modelling.

It also provides several standalone inference methods that - among others - include reference-free determination of genetic diversity within and between individuals and populations. These genetic measures can be, together with individual ancestral affinities, directly compared to archaeological distance measures and interpreted in relation to archaeologically associated cultural markers.

We demonstrate the utility of these approaches on palaeogenomic data obtained from up to 9,000 years old samples from sites associated with Lepenski Vir culture, including the settlement at the eponymous site. Genetic and cultural affinities of individuals from Mesolithic, Transition and Neolithic periods provide insights into an active role of these fisher-hunter-gatherers during the Neolithisation of the area of Central Balkans and the structure of their sedentary society.

02 A HIGH-RESOLUTION TIME TRANSECT THROUGH THE LECH VALLEY, BAVARIA: POPULATIONS – FAMILIES – INDIVIDUALS

Author(s): Mitnik, Alissa (Max Planck Institute for the Science of Human History, Jena; Institute for Archaeological Sciences, University of Tübingen) - Knipper, Corina (Curt-Engelhorn-Centre Archaeometry gGmbH, Mannheim) - Massy, Ken (LMU Munich) - Stockhammer, Philipp W. (LMU Munich; Max Planck Institute for the Science of Human History, Jena) - Krause, Johannes (Max Planck Institute for the Science of Human History, Jena; Institute for Archaeological Sciences, University of Tübingen)

Presentation Format: Oral

While palaeogenomic research used to be contingent on the discovery of the rare sample with exceptional DNA preservation, targeted enrichment and subsequent high-throughput sequencing of selected informative genetic markers has made possible the cost- and time-effective analysis and comparison of large numbers of ancient samples. As a result, high-resolution studies on a microregional level that address social dynamics and local and individual variations in ancestry and mobility become a feasible pursuit.

Here, we present the genomic analysis of over 120 individuals from the Lech valley in southern Bavaria, Germany, which offers ideal conditions for such a study. Several burial sites containing rich archaeological material were directly dated to the second half of the 3rd and first half of the 2nd millennium BCE and associated with the Final Neolithic Bell Beaker Complex and the Early and Middle Bronze Age.

Utilising relatedness inference methods developed for low-coverage modern DNA we are able to reconstruct multigenerational pedigrees that likely represent core families within the communities that buried their dead at each cemetery.

Joint analysis with several hundred published ancient genomes allows us to estimate proportions of distinct ancestries in each individual to evaluate sex biased migration and admixture.

Within an interdisciplinary framework, comprehensive archaeological assessment and stable isotope analyses were an integral part of this project. Thus, we gain additional insights into distribution of wealth and individual mobility, providing us with a more holistic view of the social structure of these prehistoric societies and the modes of cultural transition.

03 KEEPING IT LOCAL: A CASE STUDY IN REGIONALISED APPROACHES TO PALAEOGENOMICS USING PREHISTORIC POPULATIONS FROM THE BURREN, CO. CLARE

Author(s): Cassidy, Lara (Trinity College Dublin) - Ó Maoldúin, Ros (The Irish Fieldschool of Prehistoric Archaeology; IT Sligo; NUI Galway) - Jones, Carleton (NUI Galway) - Lynch, Ann (National Monuments Service Ireland) - Eogan, James (Transport Infrastructure Ireland) - Bradley, Daniel (Trinity College Dublin)

Presentation Format: Oral

The Burren, in the west of Ireland, is a karstic limestone landscape with an unusually dense collection of Neolithic and Bronze Age megalithic tombs, upon which there is a good history of research. The availability and quality of samples and our knowledge of the remains make it an excellent arena to test the extent to which regionalised questions can be addressed through ancient DNA analysis. Here, Neolithic and Bronze Age populations from diverse burial contexts are sequenced to a median of 1X genomic coverage, allowing for the accurate imputation of diploid genotypes. This combination of dense sample sets and diploid calls is a key requirement in the identification of finescale population structure among seemingly homogenous groups. Indeed, economical approaches to the creation of such data, both molecular and bioinformatic, are imperative for addressing more localised archaeological questions.

We demonstrate such potential here, using haplotypic analysis based on imputed genotypes to identify potential autosomal structure (or lack thereof) among closely related Irish prehistoric populations. Patterns of haplotypic chunk sharing are used to identify outlying individuals within populations, while signals and likely geographical sources of recent introgression events from divergent groups are explored based on chunk length distributions. These methods are particularly powerful when combined with patterns observed in uniparental markers. Maximum likelihood methods for the estimation of genetic relatedness among low coverage samples are utilized to demonstrate the varied kinship dynamics associated with different megalithic tomb types, which may reflect the potentially diverse and ever-changing social functions of such constructions. Finally, the creation of a dense sample set which spans the window of migratory influx that occurred into Ireland during the Neolithic to Early Bronze Age transition allows us to explore how larger continental-scale upheavals may have manifested, both culturally and genomically, at a local level.

04 KINSHIP RELATIONSHIPS AND GENOMIC ORIGINS OF THE PEOPLES BURIED IN AN EARLY MEDIEVAL CEMETERY IN CENTRAL EUROPE

Author(s): Díez-del-Molino, David (Department of Bioinformatics and Genetics, Swedish Museum of Natural History, Stockholm; Archaeological Research Laboratory, Department of Archaeology and Classical Studies, Stockholm University) - Krzewinska, Maja (Archaeological Research Laboratory, Department of Archaeology and Classical Studies, Stockholm University) - Juras, Anna (Department of Human Evolutionary Biology, Institute of Anthropology, Faculty of Biology, Adam Mickiewicz University in Poznań) - Chyleński, Maciej (Institute of Archaeology, Faculty of History, Adam Mickiewicz University in Poznań) - Pospieszny, Łukasz (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Warsaw) - Götherström, Anders (Archaeological Research Laboratory, Department of Archaeology and Classical Studies, Stockholm University)

Presentation Format: Oral

Historical cemeteries represent valuable sites to study the economic, political and social structures of the populations living on a specific epoch in time and in a particular geographical location. The richness of archaeological finds and wealthy artifacts that have been found in this early medieval cemetery in central Europe, including high-quality jewelry, ornaments, coins and amulets, suggest that those buried there probably had a high social status. At the same time, many of the burials seem to be composed of familiar units, suggesting that the cemetery was used for an elite of dwellers and their families in the context of important trading routes. In this study we used ancient DNA techniques to sequence the complete nuclear genomes of more than 20 individuals buried in a cemetery that was used for a period comprising about a hundred years (950-1050 AD). We analyze the social structure and funerary practices of the population they represent by disentangling close kinship relationships between the individuals. We use this data together with an extensive panel of European reference samples, evidence from archaeological material, and patterns of strontium isotopes, to explore the origins and genetic affinities of the peoples buried in the cemetery, and to place them in the broader genetic context of the peoples of the Middle Ages in Europe.

05 DUTCH POPULATION HISTORY FROM A GENETIC PERSPECTIVE

Author(s): Altena, Eveline - Smeding, Risha - Kraaijenbrink, Thirsa (Dept. of Human Genetics, Leiden University Medical Center) - Gaag, Kristiaan (Dept. of Biological Traces, Netherlands Forensic Institute, Den Haag) - Diekmann, Yoan - Thomas, Mark G. (Dept. of Genetics, Evolution and Environment, University College London) - Knijff, Peter (Dept. of Human Genetics, Leiden University Medical Center)

Presentation Format: Oral

In this paper we attempt to investigate demographic processes and social structures in the (post) medieval Netherlands by means of ancient DNA. Ancient DNA analysis is a powerful method in reconstructing past demographic events and social structures, as became evident in the last years based on large scale ancient DNA studies. However, identifying complex processes and structures on a regional level in recent Europe, when the population is relatively homogenized, would require large data sets that are distributed in time and space to avoid oversimplifying the past with (statistical) modelling. Although genome wide SNP analysis is currently the choice of preference in ancient DNA studies, STRs might be beneficial when trying to pick up on relatively recent and short term processes since they mutate much faster than SNPs and are multi-allelic.

For this study we analysed over 700 Dutch archaeological skeletons from four different urban populations, dating from the Middle Ages to 1850 AD. This data set was examined for autosomal STRs, Y-chromosomal STRs and SNPs and mitochondrial SNPs. The substantial size of this unique historical dataset, in combination with more than 2000 modern Dutch individuals, provides us with sufficient statistical power in estimating heterozygosity, population pairwise differences and population continuity.

We were able to identify subtle but significant differences in time and space. By adding additional bioarchaeological information and connecting each population with its own specific historical context we can also infer detailed information on social aspects of our studied historical populations. This does not only significantly contribute to our knowledge of Dutch (population) history, but is also crucial information for studies on selection in the Dutch population over time.

06 TERMINAL PLEISTOCENE ALASKAN GENOME REVEALS FIRST FOUNDING POPULATION OF NATIVE AMERICANS

Author(s): Willerslev, Eske (Cambridge)

Presentation Format: Oral

When and how early peopling of the Americas occurred remains debated. The remains of two infants were recovered at Upward Sun River (USR), Alaska, and have been dated to around 11.5 thousand years ago (ka) making them the oldest human remains from what is believed being the entrance route to the Americas. By sequencing the USR1 genome to an average coverage of approximately 17 times, we apply a number of population genetic methods to show that USR1 is most closely related to Native Americans, but falls basal to all previously sequenced contemporary and ancient Native Americans. As such, USR1 represents a distinct Ancient Beringian population. Using demographic modelling, we infer that the Ancient Beringian population and ancestors of other Native Americans descended from a single founding population that initially split from East Asians around 36 ± 1.5 ka, with gene flow persisting until around 25 ± 1.1 ka. Gene flow from ancient north Eurasians into all Native Americans took place 25-20 ka, with Ancient Beringians branching off around 22-18.1 ka. Our findings support a long-term genetic structure in ancestral Native Americans, consistent with the Beringian 'standstill model'. We show that the basal northern and southern Native American branches, to which all other Native Americans belong, diverged around 17.5-14.6 ka, and that this probably occurred south of the North American ice sheets.

We also show that after 11.5 ka, some of the northern Native American populations received gene flow from a Siberian population most closely related to Koryaks, but not Palaeo-Eskimos, Inuits or Kets, and that Native American gene flow into Inuits was through northern and not southern Native American groups. Our findings further suggest that the far-northern North American presence of northern Native Americans is from a back migration that replaced or absorbed the initial founding population of Ancient Beringians.

07 A PALAEOGENOMIC STUDY INVESTIGATING EARLY MEDIEVAL MIGRATION IN SOUTHERN GERMANY AND THE PECULIAR PHENOMENON OF ARTIFICIAL SKULL DEFORMATION

Author(s): Burger, Joachim (iOME - Institute of Organismic and Molecular Evolution, Mainz) - Harbeck, Michaela (SNSB, State Collection for Anthropology and Palaeoanatomy, Munich) - Groß, Melanie (iOME - Institute of Organismic and Molecular Evolution, Mainz) - Rott, Andreas (SNSB, State Collection for Anthropology and Palaeoanatomy, Munich) - Veeramah, Krishna (Department of Ecology and Evolution, Stony Brook University)

Presentation Format: Oral

Many modern European states trace their roots back to the Early Medieval period. To genetically better characterize this formative phase of Central European population history we have conducted a population-level analysis of people from this era, generating genomic data from almost 40 graves mainly from archaeological sites in present-day southern Germany mostly dating to around 500 AD. For comparison we sequenced a soldier of the Roman army from Bavaria, Sarmatians from southern Russia, and individuals with artificially deformed skulls from Serbia and Crimea.

We developed a novel capture array that generated high coverage DNA sequence data in all individuals from neutral regions, as well as 486 functional polymorphic sites. Examination of the panel of functional loci revealed that many alleles associated with recent positive selection were already at modern-like frequencies in European populations ~1,500 years ago. Analysis of the neutralome indicates that while men generally had ancestry that closely resembles modern northern and central Europeans, women exhibit a very high genetic heterogeneity; this includes signals of genetic ancestry ranging from West Europe to south-eastern Europe, Greece/Anatolia and to East Asia. The inferred female-biased migration indicates complex demographic processes during the Early Medieval Period have contributed in an unexpected way to the making of the modern European genetic landscape.

08 USING HAPLOTYPES TO EXTRACT ADDITIONAL ANCESTRAL INFORMATION OUT OF ANCIENT DNA RESOURCES

Author(s): Hellenthal, Garrett (University College London)

Presentation Format: Oral

DNA from ancient human remains (aDNA) is revolutionizing our ability to explore human history with genetic data. However, a major limitation in this field is the lack of high-quality aDNA samples representing different cultures and/or time periods. Due to this limitation, the most commonly-used approaches currently applied in paleogenomic inference do not exploit correlations among neighboring genetic markers, i.e. haplotype information, to increase power when inferring genetic ancestry. However, as we illustrate in applications to real data, statistical approaches that incorporate haplotype information have shown substantial gains in precision when applied to the abundantly available high-quality genetic variation data from modern-day individuals. In particular we highlight their increased ability to unearth genetically distinguishable sub-groups within a specific culture or geographic region, and to identify and date intermixing events among different groups. We then describe how haplotypes can still be utilized when inferring the ancestral history of ancient cultures despite the small numbers of high quality aDNA samples (e.g. 1-2 available individuals per culture), by leveraging information from the large amounts of available data from modern-day individuals. We also report methodological advances that can be used to extract haplotype information from the low-quality aDNA samples that are much more readily available among current aDNA collections.

a. DNA SEQUENCES OF CO1 AND ITS1 GENES OBTAINED FROM ANCIENT CLONORCHIS SINENSIS EGGS REMAINED IN JOSEON DYNASTY MUMMIES

Author(s): Hong, Jong Ha (Laboratory of Bioanthropology, Paleopathology and History of Diseases, Seoul National University College of Medicine) - Oh, Chang Seok (Laboratory of Bioanthropology, Paleopathology and History of Diseases, Seoul National University College of Medicine; Institute of Forensic Science, Seoul National University College of Medicine, Seoul) - Seo, Min (Department of Parasitology, Dankook University College of Medicine, Cheonan) - Shin, Dong Hoon (Laboratory of Bioanthropology, Paleopathology and History of Diseases, Seoul National University College of Medicine; Institute of Forensic Science, Seoul National University College of Medicine)

Presentation Format: Poster

The parasitological information obtained from archaeological specimens can propose speculation about the parasite-infection patterns that prevailed in ancient societies. In this study, we thus analyzed *Clonorchis sinensis* (*C. sinensis*) DNA extracted from the ancient feces or liver of 16th-18th century Korean mummies, especially on Cytochrome C Oxidase Subunit 1 (CO1) and internal transcribed spacer 1 (ITS1) genes. The mummies (n=5; Mungyeong, Dalsung, Cheongdo, Hadong1 and Andong) found in the graves of Joseon period (1392-1910 CE) were used in this study. This kind of graves was used mainly by the upper-class people of Joseon period. The samples are ancient feces obtained from mummy intestine (Dalsung, Hadong1 and Andong); or the liver (Mungyeong and Cheongdo). After *C. sinensis* genes were successfully amplified from two mummies (Mungyeong and Andong), consensus sequences were determined by the alignment of the sequences of cloned PCR products. The obtained CO1 and ITS1 sequences were

well matched with those of already reported *C. sinensis*, but can be clearly differentiated from other species such as *Opisthorchis viverrini* and *Pseudamphistomum truncatum*, etc. By the phylogenetic analysis of the ITS1 gene, we tried to see the clustering according to regional differences of the *C. sinensis* examined. This study shows the genetic characteristics of ancient *C. sinensis* in Joseon period of Korea by comparison with those of modern *C. sinensis* sequences worldwide. To improve the knowledge about *C. sinensis* evolution in much detail, *C. sinensis* gene sequences must be obtained from the regions of much wider geo-historical scope in forthcoming studies. This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIP) (no. NRF-2016R1A2B4015669). For any queries about this presentation, please contact MS (bbbenji@naver.com) or DHS (cuteminjae@gmail.com).

b. MITOGENOMIC DATA OF MEDIEVAL INDIVIDUALS “DUMPED” IN A COMMON BURIAL PIT FROM SOUTHEASTERN ROMANIA

Author(s): Rusu, Ioana (Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babeş-Bolyai University, Cluj-Napoca) - Modi, Alessandra (Department of Biology, University of Florence) - Radu, Claudia (Faculty of History and Philosophy, Babeş-Bolyai University, Cluj-Napoca) - Mircea, Cristina (Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babeş-Bolyai University) - Bodolică, Vitalie - Potârniche, Tiberiu - Dobrinescu, Cătălin (Museum of National History and Archeology, Constanta) - Popescu, Octavian (Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babeş-Bolyai University, Cluj-Napoca) - Caramelli, David (Department of Biology, University of Florence) - Kelemen, Beatrice (Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babeş-Bolyai University, Cluj-Napoca)

Presentation Format: Poster

The medieval human remains investigated in this study were discovered in a circular common burial pit from Capidava (Dobruja), which is surprising, giving the fact that the rest of the individuals deposited in the necropolis seem to be individually buried according to Christian rituals. The morphological analysis of the osteological remains revealed the presence of dental and skeletal pathological features and trauma, indicating the poor life-quality of the individuals from the common grave in contrast to those from the rest of the necropolis. Who are these individuals? Why were they disposed of in a common burial pit? Are they genetically different from the individuals from the Christian graves?

This study aims to shed light, using phylogenetic and phylogeographic analysis, on the genetic connections between a small group of individuals (buried in an unusual funeral custom) and other archaic and modern pools in order to answer some questions raised by archaeological and physical anthropology analyses.

The complete mitochondrial genome of 6 individuals was reconstructed using hybridization-based DNA capture combined with Next Generation Sequencing. Each of the analyzed samples displays a distinct haplogroup/haplotype indicating that there are no close maternal relationships among them, in contrast to the individuals from the Christian necropolis where identical maternal lineages were identified in specimens from adjacent graves. Another characteristic of the common grave individuals is the lack of presence of East Eurasian component. While half of the Capidava common grave haplogroups are ubiquitous across Eurasia, the remaining ones are restricted either to Southwestern Europe, Caucasus-Near East or Europe.

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COMPLEX BIOGRAPHIES: HIGH-RESOLUTION CHRONOLOGICAL METHODS APPLIED TO THE STUDY OF LATE PREHISTORIC FUNERARY PALIMPSESTS

Theme: Theories and methods in archaeological sciences

Organisers: Díaz-Zorita Bonilla, Marta (Tübingen Universität) - Aranda Jiménez, Gonzalo (University of Granada) - Díaz del Río, Pedro (CSIC, Instituto de Historia, Madrid) - Lozano Medina, Águeda (University of Granada)

Format: Regular session

Funerary practices normally appear to archaeologists as intricate palimpsests. The frequent use of funerary spaces during long periods, produces a mass of human bones together with other kind of ritual depositions that were found piled on top of each other, overlapping in many occasions. Primary depositions were typically disturbed by later activities, mainly subsequent burials, but also by horizontal and vertical displacements as a result of factors such as gravity and voids created by the decomposition of soft tissue. Approaching the study of these archaeological contexts is as much as trying to understand the different practices that involve the accumulation and transformation of successive and partially preserved ritual activities. As Gavin Lucas (2005) has pointed out, palimpsests “refer to the traces of multiple, overlapping activities over variable periods of time and the variable erasing of earlier traces”.

Temporality appears in such archaeological contexts as a key feature to untangle their complex biographies. The stratigraphic sequence is an obvious criterion but its degree of resolution is low when we confront with layers of multiple events formed during an uncertain chronological period. High-resolution chronological methods and the statistical modelling of large series of dates emerge as the best way to understand not only the general temporality of palimpsests, but also to identify different episodes of deposition, their time span, intensity and chronological hiatuses. The aim of this session is to discuss the particular nature of this kind of contexts and how we can explore their temporality with different high-resolution chronological methods.

01 PALIMPSESTS AND RADIOCARBON CHRONOLOGY

Author(s): Lozano Medina, Águeda - Aranda Jiménez, Gonzalo (University of Granada) - Díaz-Zorita Bonilla, Marta (Tübingen Universität) - Sánchez Romero, Margarita (University of Granada) - Escudero Carrillo, Javier (Tübingen Universität)

Presentation Format: Oral

Many archaeological contexts constitute truly palimpsests, that is, they are the results of different episodes of deposition that are found superimposed and/or re-worked in such a way that it is difficult or even impossible to separate them into well-defined events. Additionally, the preserved material traces of these events are normally so mixed up that they blur the original individual episodes of deposition. However, the complexity of such contexts has rarely been considered when studying their chronology and temporality, which has resulted in poor or clearly inaccurate temporal discussions. A proper approach to the temporal study of these archaeological contexts needs to understand the different events that involved the accumulation and transformation of successive, partially preserved activities. When the intricate nature of these contexts is considered, high-resolution chronological methods and the statistical modelling of large series of dates emerge as the best way to understand not only the general temporality of palimpsests, but also to identify different episodes of deposition, their time span, intensity and chronological hiatuses. The use of large series of radiocarbon measurements from samples selected after a detailed analysis of the available material, context of provenance and taphonomy could be crucial to untangle the social practices that created the palimpsests.

02 RECONSTRUCTING FUNERARY PRACTICES IN THE COLLECTIVE TOMB OF MONTE DO CARRASCAL 2, HYPOGEUM I (BEJA, PORTUGAL) THROUGH HIGH-RESOLUTION CHRONOLOGICAL METHODS

Author(s): Neves, Maria João (CIAS - Research Centre for Anthropology and Health - University of Coimbra) - Silva, Ana Maria (CIAS - Research Center for Anthropology and Health - University of Coimbra; Uniarq - University of Lisbon) - Peyroteo Stjerna, Rita (Dep. Organismal Biology Evolutionary Biology Centre Uppsala University)

Presentation Format: Oral

Hypogeum I of Monte do Carrascal 2 (Beja, Portugal) is one of the several collective graves found near the important Neolithic-Chalcolithic settlement of Porto Torrão, located in central Alentejo. The tomb was partially excavated and only one layer (ue2) was fully dug. In this layer (4 sqm) we have identified the remains of 62 individuals (40 adults, 22 non-adults) in juxtaposed position. However, despite the good preservation of the bones, the skeletons presented different degrees of completeness.

Archaeo-anatomical observations were registered throughout the whole excavation process, the exact position of each bone was recorded, and all elements were numbered and identified. The state of the skeletons' labile and persistent anatomical connections was documented as well as the stratigraphic relations between the different bone elements and individuals in order to discuss the rhythm of the depositions and post-depositional events. These data were later integrated into a single GIS database. Archaeo-anatomical and stratigraphic data were cross-examined with a set of radiocarbon dates allowing rigorous characterization of the chronology of this funerary phase.

Field observations were examined having into account different high-resolution chronological methods. In this paper we present a detailed reconstruction of the episodes of deposition of human remains in terms of time span, duration, frequency, and hiatuses contributing not only to better knowledge of the biography of this funerary space, but most importantly to the discussion of the importance of the application of a set of methods of analysis if we want to account for the temporality of complex mortuary contexts.

03 INTERPRETATIVE APPROACH TO THE MEANING AND TEMPORALITY OF THE CLOSURE PRACTICES RECORDED IN THE MEGALITHISM OF DOURO BASIN

Author(s): Tejedor Rodriguez, Cristina (INCIPIIT, CSIC)

Presentation Format: Oral

The current image "in ruins" of most of the megaliths has been the main reason why it has traditionally been interpreted that most of them were abandoned, rejecting the possibility of recording archaeographically many archaeological events. This is the case of the closure practices, which have been absent in the peninsular bibliography until a few years ago.

In this paper, we will examine the variability of this type of events throughout the chronological interval analyzed (IVth-IInd millennium cal. BC), in order to observe and evaluate the changes in the closing resources chosen along the time. Despite this diversity, the archaeological record of this "uses" is not difficult because these activities are intentional and are developed, not in a chaotic way, but according to a patterned strategy.

Thanks to the singularity of these practices, it is possible to get good samples for radiocarbon dating from these kind of contexts. Their chronological characterization, through the application of different Bayesian analysis (the corpus of data of this work is composed by more than thirty dates), has allowed us to study the continuity and discontinuity of this phenomenon, represented throughout all the time interval. The results point to the existence of two specific moments (the first one, along the first centuries of the IVth millennium cal. BC, and the second one, between the end of the IVth and the beginning of the IIIrd millennium cal. BC), in which the users of the megaliths decided to seal them definitively. These two episodes are characterized by the implementation of different closing resources, so that the most of the practices of "closing fire" and "tumulation" are gathered in the oldest moments of the

sequence as long as in more recent phases the complete sealing of the interior accesses with soil and stones was more usual.

04 PREHISTORIC ENCLOSURES AS PALIMPSESTS: A DEPOSITION OF HUMAN REMAINS IN DITCH 5, MARROQUÍES (JAÉN, SPAIN)

Author(s): Milesi, Lara - Aranda Jiménez, Gonzalo (Universidad de Granada. Facultad de Filosofía y Letras) - Díaz-Zorita Bonilla, Marta (Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters, Eberhardt Karls Universität) - Beck, Jess (McDonald Institute for Archaeological Research) - Lozano Medina, Águeda - Sánchez Romero, Margarita (Universidad de Granada. Facultad de Filosofía y Letras) - Escudero Carrillo, Javier (Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters, Eberhardt Karls Universität)

Presentation Format: Oral

Prehistoric enclosures produce intricate archaeological palimpsests as they result from multiple and overlapping social activities. A noteworthy feature of such monumental constructions is the deposition of human bones within their boundaries, with skeletal remains frequently found scattered inside enclosure ditches. However, it is rare that complete individuals or articulated anatomical elements are found in this kind of depositions. Marroquíes, a large enclosure site that incorporates six concentric ditches, offers an excellent opportunity to explore the nature of these palimpsests. To this end, a deposition of human remains found in Ditch 5 has been analysed using a multiproxy approach that incorporates: i) bioarchaeological characterization of the sample, including demographic data such as assessments of age and sex as well as an evaluation of health; ii) the degree of skeletal fragmentation and anatomical representation; iii) an evaluation of the taphonomic features of the osteological record; iv) the characterization of the stratigraphic units in which the bones were deposited; and iv) radiocarbon dating of the minimum number of individuals. All of these proxies suggest complex mortuary practices that entailed a clear secondary deposition of previously skeletonized human bone remains. The results will also be discussed in the context of the prehistoric enclosure phenomenon in Iberia.

05 TEMPORALITY AND CHRONOLOGY OF THE NECROPOLIS OF LA BELEÑA (CABRA, SPAIN)

Author(s): Rodríguez-Santos, Francisco Javier (Instituto Internacional de Investigaciones Prehistóricas de Cantabria, Universidad de Cantabria) - Santana-Cabrera, Jonathan (Department of Archaeology, Durham University; Marie Curie Skłodowska Fellow) - Camalich Massieu, María Dolores - Martín-Socas, Dimas (Departamento de Geografía e Historia. UDI de Prehistoria, Arqueología e Hª Antigua. Universidad de La Laguna) - Aranda Jiménez, Gonzalo - Lozano Medina, Águeda (Departamento de Prehistoria y Arqueología. Universidad de Granada) - Caro Herrero, José Luis (Departamento de Lenguajes y Ciencias de la Computación, Universidad de Málaga) - Caballero-Crespo, Amparo (Departamento de Geografía e Historia. UDI de Prehistoria, Arqueología e Hª Antigua. Universidad de La Laguna)

Presentation Format: Oral

La Beleña (Cabra, Spain) is a necropolis located in the south of Iberia, dated in the transition between Late Neolithic/Early Chalcolithic periods (3345-2886 cal. BC). It consists in negative funerary structures such as hypogea and pits, excavated in the marl rock. This type of necropolis is widespread in the south of Iberia from the middle of the 4th to 3rd millennium BC. Since 2015, four burials have been excavated during three archaeological seasons, showing different architectural features and funerary practices. Evidences show that they were closed and were not been affected by re-use or subsequent disturbances, helping to the good preservation of human remains and grave goods. To date, we have available series of radiocarbon dating for three burials, which complement the results of the archaeological and archaeoethnological approaches.

In these burials, we documented primary and secondary assembles of human bones and grave goods, expressing a significant complexity in the funeral practices. This complex funerary custom makes difficult to discriminate the temporal relationship between the funerary events and the stratigraphic sequence. In order to investigate the temporal sequence of these burials, direct 14C dates were obtained on human bones. Samples were selected according to the minimum number of individuals (MNI). We also used a Bayesian approach to model the start and end date of funerary activity as well as its overall span. This approach is required when there are no direct stratigraphic relationships between the different set of remains that constitute the archaeological record. The results indicate that the three burials were used simultaneously during the last three centuries of the 4th millennium cal. BC. In addition, several funerary episodes have been recognized according to both archaeoethnological and radiocarbon dating. These results contribute to investigate the complexity of the burial practices during the Late Neolithic/Early Chalcolithic of southern Iberia.

06 UNTANGLING FUNERARY PALIMPSEPTS: THE RADIOCARBON CHRONOLOGY OF THE MEGALITHIC PHENOMENON IN SOUTHEASTERN IBERIA

Author(s): Díaz-Zorita Bonilla, Marta (Tübingen Universität) - Lozano Medina, Águeda - Aranda Jiménez, Gonzalo - Sánchez Romero, Margarita (University of Granada) - Escudero Carrillo, Javier (Tübingen Universität)

Presentation Format: Oral

The megalithic funerary practices in south-eastern Iberia normally appear as intricate palimpsests resulting from multiple and overlapping ritual activities over variable periods of time. The Bayesian modelling of large radiocarbon series provides a great opportunity to explore these complex sequences of depositional events. For this purpose, we design an innovative dating strategy based on three main criteria: i) we focused primarily on human bone remains from the necropolises of El Barranquete, Panoría, El Jautón, and La Atalaya; ii) we decided to follow a strategy to date the remains based on the minimum number of individuals (MNI) of each tomb as the best way of ensuring that all individuals were dated, but none was dated twice; and iii) all dated samples were also chosen for carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) stable isotope analysis to identify the potential influence of the so-called "reservoir effect" in

radiocarbon measurements. As result, the timespan diversity in the funerary use of the megalithic monuments emerges as a very outstanding feature. Tombs range from a few decades of mortuary activity, even with the possibility that all the individuals died at the same time, to long periods of use spanning centuries and different phases of interments of probably unrelated people.

07 EXPLORING TEMPORALITY IN A NATIVE AMERICAN BURIAL GROUND IN SOUTHERN CALIFORNIA USING GRAPHING SOFTWARE

Author(s): Ciolek-Torello, Richard - Grenda, Donn - Stanton, Patrick - Heckman, Robert (Statistical Research, Inc.)

Presentation Format: Oral

In this presentation, we report on a Native American burial ground in coastal southern California. Located at the edge of a lagoon, the site of LAN-62 was used by small groups of people for resource procurement and processing for over 5,000 years. Sometime late in prehistory, however, it became a major burial ground used by Native Americans from a much larger surrounding region to bury hundreds of individuals. As in the case of other burial grounds used over long periods of time, we found a mass of human remains along with evidence of associated mortuary activities and earlier unrelated domestic activities. Inspired by the Harris matrix, we constructed a Feature Relationship Empirical Diagram (FRED) as an exploratory tool for defining relationships between the palimpsest of burials and other features at the site. The appeal of the Harris matrix for this project was that it enabled us to visualize and interpret sequential relationships between the numerous and often overlapping burial features. The Harris matrix, however, organizes such analytical units only on the basis of observed stratigraphic relationships, which limits the explanatory ability of the matrix at a site like LAN-62, where many of the burials were dug into the same stratum, often overlapping or even intrusive into one another. Thus, most of the burials cannot be relatively dated solely on the basis of stratigraphic superposition. To resolve this problem, FRED uses a complex graphing software that incorporates independent high resolution C14 dates, relative dates from temporally diagnostic artifacts such as glass and shell beads, contemporaneous objects such as refitted artifact fragments, and most importantly direct observations of intrusive relationships. Application of these dating methods allowed us to identify unique relationships between groups of burials and behavioral parameters that, in turn, allowed us to describe the development of the burial ground.

353 ARCHAEOACOUSTICS - DISCUSSING SOUND IN ARCHAEOLOGICAL CONTEXTS

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Mattioli, Tommaso (University of Barcelona, Dept. of History and Archaeology) - Rainio, Riitta (University of Helsinki, Dep. of Musicology)

Format: Regular session

This session will explore the role of sound in archaeological contexts from prehistoric to historical times. It will serve as a platform to promote discussion on a variety of themes related to sound archaeology, music archaeology and archaeoacoustics. To start with, we would like to foster debate on how sound may be used to produce intangible cultural signs that can act at the level of the individual and the collective. These may have multiple and multifaceted effects, particularly in the context of the sacred. Secondly, papers on new technologies enabling the analysis of sound behavior both in ancient artificial structures and landscapes will be welcomed. These may also relate to how architectural manipulation can have significant effects on the propagation of sound waves. The third theme to deliberate on will be new insights into how people in the past used special acoustic spaces and instruments for community rituals, musical performances, religious ceremonies, and navigating the landscape. Fourthly, we would like to encourage discussion on neuropsychological reactions to sound, particularly those associated with altered states of mind. Finally, contributions on the preservation of endangered sonic heritage and environments are also welcomed. In this session we aim to bring together researchers from various disciplines, such as archaeology, acoustic engineering, musicology, soundscape studies, anthropology, neuropsychology and heritage.

ABSTRACTS

01 STUDIES IN THE SOUND DIMENSION OF PAINTED CAVES AND OUTDOOR PAINTED ROCKS

Author(s): Reznikoff, Igor (University of Paris Nanterre)

Presentation Format: Oral

Since 1983, we have studied the resonance of Palaeolithic painted caves (mostly in France) and shown a strong relationship between the quality of the resonance and the location of the paintings; since 1987, we studied the resonance in open air, in connection with painted rocks (in Finland, France, Spain and Morocco). More recently, many such studies have been carried on by various research teams. In our contribution, we will compare the conditions, the methods, the needed rigour and the results so far obtained here and there, in these two different environments.

Obviously, in the caves, the studies are much easier to be carried out since the space is limited, although some caves are very large and to have a complete understanding of acoustics of such caves with all its galleries, halls, recesses, may take time. But the space

around painted rocks is potentially unlimited, and one has to find a natural reasonable limit. Also, geologically, the possible changes in the outside landscape (level of ground, of waters for lakes, of vegetation, etc.) since thousands and thousands of years are much more complicated than in caves. However, the main ideas, methods and practice, as well as finally, the results, can be fruitfully compared. The main conclusion being that for ancient tribes, caves, paintings, rocks and landscape were deeply linked particularly by the sound of the voice in rituals and celebrations which the paintings may suggest.

02 ARCHAEOACOUSTICS AND THE SINGING STONES

Author(s): Devereux, Paul (Time & Mind Journal)

Presentation Format: Oral

In this paper I note the date and circumstance of the formal acceptance and naming of archaeoacoustics as an area of archaeological study, and briefly outline three main methods of studying sound at archaeological sites: (i) modern musical or vocal performance at sites to test their acoustic properties; (ii) the use of electronic monitoring equipment to explore and measure the acoustics of monumental sites, and (iii) listening to the natural sounds occurring at a site, whether issuing from the structure itself, or from environmental factors such as echoes, the local sound of rushing water, wind, rain, etc. After giving a very brief example of each of the first two methods (including work I was involved with that revealed regional brain changes caused by a certain frequency inside chambered Neolithic monuments that we tested), I focus on method (iii), explaining the significance given to ringing rocks and lithophones in the ancient world, especially in China, India and Africa, give a few specific examples of such features, and finally describing some of my own fieldwork with ringing rocks and lithophones, including reference to a study of the soundscape at Carn Menyn, the Welsh origin area of the Stonehenge bluestones, which I initiated with the Royal College of Art.

03 EXPLORING AUDITORY PERCEPTION AT PREHISTORIC ROCK PAINTINGS IN FINLAND

Author(s): Lassfolk, Kai - Rainio, Riitta - Lappi, Otto - Pekkanen, Jami (University of Helsinki)

Presentation Format: Oral

In Finland, there are a number of steep cliffs situated on old water routes. The prehistoric rock paintings on these cliffs suggest that the sites were used for ritual activities possibly including music making. Moreover, the steep cliffs form a special acoustic environment distinct from the nearby surroundings and, especially, contemporary settlement sites. In 2013, a multidisciplinary research project was started to study both the topographical, visual and sonic properties of these sites. The research methods at the first stage included acoustic impulse response measurements and 3D laser scanning. In 2018, new fieldwork is being performed to collect data for auralization demonstrations, virtual reality renderings and eye tracking measurements.

This paper describes the methods and results of the fieldwork carried out in 2013–2016 and gives an overview of the new methodology used in the auralization tests. In the acoustic measurements, special attention was paid to the audio spectrum and angle-of-arrival of the discrete early reflections that characterize the acoustics of all studied sites. The measurements indicate that the steep painted cliffs reflect sound forcibly and create echoes that appear to emanate from the direction of the rocks or painted figures on them. The new auralization and eye tracking tests, employing acoustic and visual renderings of the sites in VR, aim to link subjective aural experiences with the angle-of-arrival measurements. Furthermore, the auralization techniques will be used for public demonstrations of the acoustics of the sites.

04 SOUND AND THE LANDSCAPE LOCATION OF SCANDINAVIAN ROCK ART: AN INITIAL SURVEY

Author(s): Dodd, James (Aarhus University)

Presentation Format: Oral

This paper will outline and discuss the outcomes of some preliminary investigations into the relationships between acoustic effects, soundscapes and the landscape location of Southern and Northern Tradition rock art in Scandinavia. Recent rock art research worldwide is placing greater and greater emphasis on the relationships between sound and the location of rock art. As a result of a combination of own observation and inspiration from the recent scientific studies by Díaz-Andreu and Mattioli, an exploratory survey of selected aspects has been implemented as part of the field technique within several case study areas of my PhD project at Aarhus University, which is investigating the extent of homogeneity and diversity in Southern Tradition rock art.

The presentation will begin by outlining research to date in the Nordic countries concerning the influence of acoustic effects on the landscape location of rock art. Then, the tests conducted in the field will be described and their bases outlined. This will be followed by the presentation of some initial results of fieldwork derived from exploratory field survey, which consists of responses to high and low voice, whistle, and a single clap. This reconnaissance has been carried out so far at around 300 Southern Tradition rock art sites divided between the island of Bornholm, in Denmark, and the Tanum World Heritage Area, in Bohuslän, in Western Sweden. Results indicate that there are acoustical relationships at a number of the rock art sites from the Southern Tradition. The indications identified highlight a pressing need for more studies. These should be investigated through rigorous, systematic testing. One potential avenue suggested is that using sound equipment conducted by Díaz-Andreu, Mattioli et alia. The other line of enquiry to pursue should be how we can model acoustic effects using high resolution LIDAR data.

05 THE ACOUSTICS OF POST-PALAEOLITHIC ROCK ART LANDSCAPES IN SOUTH FRANCE

Author(s): Mattioli, Tommaso (University of Barcelona, Dept. of History and Archeology) - Hameau, Philippe (Laboratoire d'Anthropologie et de Psychologie Cognitive et Sociale - LAPCOS, de l'Université de Nice Sophia Antipolis) - Díaz-Andreu, Margarita (Prehistoria i Arqueologia, Facultat de Geografia i Historia, Universitat de Barcelona; ICREA - Barcelona)

Presentation Format: Oral

Individuals do not perceive places solely on the basis of what they see. Intentional and unintentional sounds may indeed affect how people engage with, transform and create environments and spaces. Data from informed methods reveal that many cultures in the past incorporated aural spaces into their representation of the world, to the extent that identities and memories of places were often derived from acoustic stimuli. Furthermore, ethnographic and ethnohistoric data provide a range of interpretations of sound-related activities that lead to fresh insights into the social values ascribed to sound by those cultures. Rock art literature has many examples of convincing explanations as to why hunter-gatherers, pastoralists, horticulturalists and agriculturalists that produced rock art decided to decorate particular spots in the landscape according to acoustic cues. This paper will address all these issues by exploring the acoustics of a sample of rock art shelters with post-Palaeolithic Schematic art in south France: Baume Brune (Joucas et Gordes), Fontjouval (Saint-Saturin les Apt), Pin de Simon (Gémenos), and Abri A des Eissartenes (Le Val). Particular emphasis will be paid to the placement of rock art in the landscape according to the auditory localization of sound reflections (echoes), the audibility of distant sounds, and the intelligibility of speech and music signals.

06 SOUND AND SONG IN THE TWILIGHT ZONE: MULTIMEDIA IMMERSION FOR A MULTISENSORY PHENOMENOLOGY OF MOJAVE DESERT ROCK ART LABYRINTHS

Author(s): Liwosz, Chester (University of California, Santa Cruz)

Presentation Format: Oral

An archaeology of visual culture has benefited tremendously from the phenomenological turn brought about in part by cognitive archaeology. In recent years, rock art scholars revisiting the ethnographic record through the framework of phenomenology have increasingly come to recognize the multisensory nature of these visual features, and the landscapes which they inhabit. Cross-culturally, rock art has shown a particular affinity for locations wherein novel acoustic phenomena can be also observed. Approaches emphasizing agency inform us that these experiences were likely discursive, with subjective sensations mediating human-thing interactions by imbuing visual, auditory, and haptic signs with animacy. Drawing on data collected at rock art sites in western North America's Mojave Desert, this paper takes an interpretive approach to integrating advancements in digital archaeology with ethnographic perspectives. Results of acoustical experiments at two research locations are presented in concert with state-of-the-art, three-dimensional digital models, and discussed in terms of a neuropsychological understanding of the ethnographic record. This study presents an immersive, multimedia environment as a tool with vast potential for advanced analysis, and data curation of parietal art and beyond. Field research comprised only of non-invasive methods additionally champion the usefulness of emerging approaches to managing cultural heritage, particularly in situations where preservation and integrity of material and sonic site characteristics is of heightened concern. Quantitative and systematically collected data used to develop this presentation bridges the divide between scientific empiricism and subjective experience. Similarly, the theoretical approach seeks to improve understanding between a Western scientific epistemology, and animistic ontologies, relying on the observation-based foundations of both. To achieve these goals, acoustic characteristics derived experimentally are recounted in context as metrics, sensations, and signs. The results - like the properties of the research locations - emphasize the apparent emergence of other-than-human agency out of synaesthetic experiences immersed in intricate and otherworldly environments.

07 CHRONOLOGICAL NOISE: ARCHAEOACOUSTICS AND ROCK ART SITES IN THE PRADES MOUNTAINS

Author(s): Díaz-Andreu, Margarita (ICREA; Universitat de Barcelona) - Viñas, Ramón (IPHES - Catalan Institute of Human Paleoeology and Social Evolution) - Mattioli, Tommaso (Universitat de Barcelona)

Presentation Format: Oral

Since 2012 a series of archaeoacoustic tests undertaken in post-palaeolithic landscapes in the Western Mediterranean have highlighted the importance of sound for the consideration of particular shelters as suitable places for rock art production. Tests have been undertaken in Spain, France and Italy under the framework of the SONART project (<http://www.archeoacustica.net>). The acoustic examination of rock art landscapes - with shelters painted with Schematic motifs in Italy and France, and with Macroschematic, Levantine and Schematic motifs in some areas of Spain - have indicated that all of them were, in diverse ways, chosen at least in part because of their acoustic properties. The acoustic trials undertaken in the Prades Mountains, in the Priorat region (Tarragona, Spain), however, provided a less clear picture. Two valleys were analysed, Fontscaldes (with seven rock art shelters) and Baridana (with nine shelters). As in the other assessed areas, we delimited a landscape with a number of sites in order to make comparisons possible. In this paper we will analyse the results obtained from the acoustic measurements, and compare the results of Levantine sites vs. Schematic sites. Finally, we will discuss the chronological framework of some types of schematic art and its effects on an understanding of sonorous landscapes

08 ARCHAEOACOUSTICS AS A NEW APPROACH IN THE STUDY OF INTANGIBLE CULTURAL HERITAGE

Author(s): Bellia, Angela (Institute for Archaeological and Monumental Heritage, National Research Council; Marie Curie Alumni Association)

Presentation Format: Oral

The application of new technologies to cultural heritage has led to important methodological changes in the protection and enhancement of monuments. This new approach is stated in the objectives of the International Council on Monuments and Sites, which aims to restore meaning and preserve the memory of historic buildings, promoting the application of technology in the assessment of monuments: this is particularly interesting with regard to the recovery of archaeological heritage. The European Commission report, *New Technologies for the Cultural and Scientific Heritage Sector*, states that virtual reality will provide “an impressive, immersive and involving product”. Within this context, archaeoacoustics is being used as a new method for the analysis of historical heritage, enabling the evaluation of the sound quality of a performative space by using auralisation techniques, which allow cognitive and physical elements to be reproduced and combined. Research has followed different approaches: from the analysis of the relationship between architecture and acoustics in their current condition, to the anechoic recordings of music to be used in the auralisation of sacred places. Using archaeoacoustics as an emerging discipline that involves the study of ancient sites, this paper aims to assess whether the cultic theatres in Sicily and South Italy were built in a precise place for their acoustical qualities, and to understand the reasons that led ancient cultures to create these spaces, as well as reconstruct how they experienced them.

This research is part of the project STESICHOROS. The Archaeology of Sound of the Cultic Theatre in a Greek City in Sicily, which has been funded by the European Commission’s Marie Curie Actions programme. H2020-MSCA-IF-2017

09 MUSIC FOR HADES: EVIDENCE FOR THE ROLE OF PERCUSSION IN GREEK ESCHATOLOGICAL BELIEF

Author(s): Kolotourou, Katerina (Independent researcher)

Presentation Format: Oral

The archaeological expeditions of the Royal Museums of Berlin at Miletus between 1899-1913 brought to light the relief pediment of a fragmentary Attic grave monument of pentelic marble (Berlin Antikensammlung Sk. 1627), which remained unpublished until recently. The analogies of the composition with grave scenes from Athenian lekythoi help date the monument at the late-5th century BC and identify the subject matter as a depiction of the Underworld sporting a rocky terrain, where two newcomers are received by Hades in the presence of one reclining and two seated figures on one end, and a seated female holding or playing a tympanon on the other end. The inclusion of the tympanon in classical funerary iconography offers a significant variation from the customary representations of the deceased as lyre players on white ground lekythoi and relevant imagery. In contrast with those, the relief from Miletus depicts within the realm of Hades the performance of a percussive instrument associated par excellence with orgiastic cult and Bacchic initiation. The presence of a female percussionist in the Underworld will be discussed both in the context of Dionysian Maenadism and of the cult and emerging iconography of Mother of Gods/Kybele/Rhea holding a tympanon from the Archaic period onwards. The scene invites us to investigate the eschatological dimensions of percussive performance and to consider the agency of percussive music, sound and/or behaviour in both funerary and fertility/renewal rituals, through comparative analysis of archaeological and iconographic evidence for their employment in Archaic and Classical Greece.

10 THE SOUNDS OF ANCIENT ART: A HOLISTIC APPROACH TO GRAECO-ROMAN SCULPTURE

Author(s): Broens, Cecilie (Harvard Center for Hellenic Studies; Ny Carlsberg Glyptotek)

Presentation Format: Oral

The five senses -visual, olfactory, tactile, gustatory, and auditory- are mostly perceived as something we as archaeologists cannot study -a kind of invisible past- and therefore often ignored in scholarship. So far, archaeology has mainly engaged and studied direct material evidence in the form of tangible objects. However, these items obviously do not represent the entire picture, as an abundance has disappeared, while other aspects are in intangible form. The particular focus on the preserved is reflected in our general approach to the Graeco-Roman aesthetic marble artworks displayed in museum collections. These artworks are in a way only “skeletons” and are far from representative of the ancient experience of the same works, leaving our perception of ancient sculpture somewhat clinical. We thus tend to forget that ancient art contains many more dimensions invisible (and inaudible) to the contemporary viewer.

Sound influences how we perceive our surroundings, including artefacts. Thus, new ideas for a “materialist philosophy” or “object-oriented ontology” have recently arisen in the theoretical discourse about sound and art, introducing a materialistic focus on sound as a process.

The research field of archaeoacoustics has so far focused primarily on aspects such as music and the relationship between architecture and sound through acoustic analyses of e.g. megalithic monuments. These studies show that the auditory experience greatly shaped the social, cultural, political, and aesthetic behaviour in past societies. In the Graeco-Roman world, sounds from the processions and rituals in sanctuaries, symposia, daily life etc. have influenced the experience of both sculpture and architecture.

This paper addresses the significance and effect of sound for the perception of ancient Graeco-Roman sculpture by including the diverse source material to sound and ancient art, such as literary sources, archaeological artefacts and experimental archaeology, as well as analyses of the sculptures themselves.

11 A SIXTH CENTURY LINK BETWEEN A REFERENCE TO REVERBERATION BY CASSIODORUS, AND THE BASILICA OF SAN VITALE AT RAVENNA

Author(s): Tronchin, Lamberto (University of Bologna) - Knight, David (University of Southampton alumnus)

Presentation Format: Oral

In this paper we discuss aspects of the acoustic character of the sixth century basilica of San Vitale at Ravenna, namely the interior reverberation and its relationship to the contemporary intellectual setting at Ravenna, the capital of the Western Empire under Ostrogothic rule. In particular, a quote by Cassiodorus (*Expositio in psalterium*, PL LXX, 742) will be explored as an indicator of acoustical knowledge and interest during the design and construction phases of San Vitale from circa A.D. 526, and by its dedication on the Octave of Easter (Quasimodo Sunday), April 19, 548. The acoustic survey and Archaeoacoustic discoveries made at San Vitale (Knight 2010, 2013, 2014, 2015, 2017; Tronchin & Knight 2008, 2016; Tronchin et al 2007) place this famous UNESCO world heritage site at the center of understanding North Italian, Ostrogothic architectural history. Cassiodorus's reference to wordless vocalization specifically to activate and improvise with the reverberant acoustics of an ecclesiastical interior is seen as an early iteration of acoustical phenomena contemporary with San Vitale. Cassiodorus's career and extensive personal experience at Ravenna allow us to tentatively posit the relevance of his sonic description as a direct reference to San Vitale. More certainly, the link between Cassiodorus's reference to reverberation experimented through vocal improvisation, and San Vitale's reverberation characteristics, together provide us with a rich example of sixth century acoustical knowledge at Ravenna.

12 OBJECTIVE VS. SUBJECTIVE APPROACH IN ARCHAEOACOUSTIC RESEARCH OF ORTHODOX CHURCHES

Author(s): Đorđević, Zorana (Institute for Multidisciplinary Research, University of Belgrade) - Novković, Dragan (The School of Electrical and Computer Engineering of Applied Studies, Belgrade) - Dragišić, Marija (Institute for the Protection of Cultural Heritage of Serbia)

Presentation Format: Oral

This paper discusses objective and subjective approaches in the archaeoacoustic research of Orthodox churches. Objective approach implies in situ measurement of Impulse Response and the comparative analysis of acoustic parameters relevant for the religious practice. Subjective approach implies the individual evaluation of room acoustics based on auralisation techniques, namely aural simulation based on binaural in situ measurements of Impulse Responses. This research considers four Serbian temples, covering the period from the 13th to the 19th century (Žiča, Manasija, Sukovo, Brzan). They were all built in stone and brick, except the wooden church in the village of Brzan which is highly representative of the Ottoman period when the use of long-lasting materials was forbidden. Since medieval times, Orthodox divine service has been continually practiced without significant changes. Dry studio recording of Byzantine chanting was post-processed with binaural convolution reverb gained through in situ measurements process in temples. Audio signal designed in such way was used for further subjective evaluation. Considering these four churches and their architectural characteristics, we compared the acoustic parameters relevant for the religious practice (RT, STI, D50, C80) and processed subjective evaluations obtained from two groups of respondents (Orthodox Church members and other confessions' members). We draw a conclusion upon the recommended values of acoustic parameters for Orthodox temples and then we compared it with the subjective data. We discuss differences between objective and subjective approaches to exploring sound in sacred places and argue for the need for their integration.

13 THE SOUNDSCAPE OF CHURCH BELLS IN THE MIDDLE AGES. AN EXAMPLE FROM NORWAY

Author(s): Hommedal, Alf Tore (University of Bergen)

Presentation Format: Oral

The location of churches in the medieval landscape was never accidental. Their relation to the landscape can be decisive for how the monumentality of a church was experienced and communicated both visibly and audibly.

Churches symbolize the worshipping Christian community as well as ecclesiastical and secular patrons. The perspective and wish to see, or to be seen, may express both a vision of control over the area and a necessity of acknowledgement for one's status. In Norwegian archaeological research the visibility of churches has therefore often been discussed.

Such an approach towards the landscape may, however, also be applied to sound from churches. The chimes of bells will reach areas and be heard even when its origin is out of sight. Thus bell ringing may function as a repetitive reminder of a church's existence, its location, its function and its status. No doubt this was also an important consideration when medieval churches were planned and built. Bell ringing would, for example, "extend" the church's liturgical sphere, reaching, reminding and incorporating people not present in the awareness of the holy Mass or divine office taking place at that very moment. The different pitches of bell sounds would even identify both the bell and the church and would also have a competitive aspect towards other churches. In addition, the chime could be used as an instrument of secular messages, e.g. for fire or to warn of a hostile attack.

This paper addresses sound landscapes related to churches in urban and rural contexts, exemplified by two sites from medieval Norway: the town of Bergen and the rural settlement of Vik in Sogn.

ON THE INTENTION TO MODIFY SOUND PROPAGATION IN MEDIEVAL AND MODERN WORSHIP PLACES: THE CASE OF THE ABBAYE DE MONTIVILLIERS

Author(s): Valiere, Jean-Christophe (CNRS - Poitiers) - Carvalho, Pauline (Freelance archeologist) - Palazzo-Bertholon, Bénédicte (Centre d'Etudes Supérieur de Civilisation Médiévale - CESCUM, UMR CNRS 7302, Université de Poitiers) - FIALA, David (Centre d'Etudes Supérieur de la Renaissance - CESR, CNRS UMR 7323, Université de Tours) - Zara, Vasco (ARTEHIS, UMR CNRS 6298, Université de Bourgogne) - Dupuy, Estèle (FORELL, EA 3816, Batiment A3, Université de Poitiers) - Polack, Jean-Dominique (Institut Jean Le Rond d'Alembert, CNRS UMR 7190 Université Pierre et Marie Curie, Sorbonne Universités)

Presentation Format: Oral

In the historical studies of ancient religious buildings, it seems obvious that builders were taking particular care of sound propagation during the construction of liturgical places. Today's researchers justify this statement on the basis of texts written by Fathers of the Church who argued about the great importance of singing and speaking during liturgy. Actually, this is indirect evidence. In logical terms, this assertion is a postulate, that is to say a non-demonstrated truth. Thanks to fifteen years of archeological and acoustical research on acoustic potteries inserted in worship places in France, we have now some evidences that the aim of the builders was to influence acoustics. Nevertheless, the scientific conceptions of the time are not perfectly understood today. If we consider for example the reverberation time, a long duration is often considered as good probably because it can reinforce spiritual emotion. However, psychoacoustic studies have shown that long reverberation is prejudicial to good perception of speech and music. In former texts, there is some evidence that good listening conditions for speech were also a concern for builders and long reverberation was not considered as good (Vitruvius, Alberti). The Abbaye de Montivilliers is a perfect example of acoustics being taken into account in architecture during centuries. In this church dating from the 12th century, the vault has been built in the crossing around the 13th century, and later acoustic pots have been inserted. In the 17th century, the vault has been lowered in order to 'relieve the voices' of the nuns, as mentioned in a contemporary chronicle of the community. Based on our long experience, we will present during the conference our point of view concerning the intention of ancient builders to influence acoustics.

SOUNDSCAPE OF SACRAL PLACES IN MEDIEVAL SERBIA

Author(s): Đorđević, Zorana (Institute for Multidisciplinary Research, University of Belgrade) - Dragišić, Marija (Institute for the Protection of Cultural Heritage of Serbia)

Presentation Format: Oral

Medieval Serbian monasteries have a specific acoustic environment – the recognizable soundscape that prepares us for the spiritual experience. This soundscape has been emphasized by medieval hagiographers. Although not intact, the key element of this soundscape still survives in the sound of percussion instruments: klepalo, bilo, and bell. This paper considers the meaning and significance of these instruments in the Serbian history and cultural identity. Klepalo and bilo were used since medieval period for convoking believers into churches for divine service. The first bells were brought to Slavic countries in the 12th century, connecting religion, traditions, and beliefs of the Serbian people ever since. They also had prophylactic and apotropaic properties, and they were used as protection against evil forces, diseases, spells, illnesses, and to dispel hail clouds. After the Battle of Kosovo (1389), all Serbian churches had bells. The oldest preserved bells from Serbia date to the 15th century (e.g., the Ćustendil, Rodop, St. Nikola church in Banja). Under the Ottoman rule, bells in Serbia were silent, prohibited and destroyed for several centuries. In order to preserve them, people hid and buried them in the ground, or threw them in rivers and wells, using klepalo and bilo instead. Thus, bells became a symbol of freedom and they still interweave people's imagination, narratives and oral history.

DOWNTOWN CHACO: PERFORMANCE SPACE, POLITICAL THEATER, AND AUDIBILITY

Author(s): Witt, David (SUNY Buffalo) - Primeau, Kristy (SUNY Albany)

Presentation Format: Oral

The authors present the continued development of an Archaeoacoustics Toolbox for GIS, used to explore the propagation of sound throughout landscapes (a.k.a. "soundsheds"). The toolbox includes a soundshed analysis tool capable of calculating distance attenuation, topographic barrier attenuation, and viewshed; a variable cover-type tool that calculates vegetation attenuation in addition to the calculations performed by the soundshed analysis tool; and a cumulative soundshed tool. These allow researchers to determine how sounds from various sources flow throughout any given landscape. By utilizing these tools, the authors explore the relationship between audibility and performance space, as illustrated by the built landscape of Chaco Canyon, New Mexico, USA.

Chaco Canyon was the center of an Ancestral Puebloan polity from approximately 850 C.E. to 1140 C.E, home to a dozen palatial structures known as "Great Houses" and scores of ritual structures called "Great Kivas." It is hypothesized that the 2.5 square kilometers centered on the largest Great House, Pueblo Bonito, (a.k.a., "Downtown Chaco") served as performance space for both political theater and sacred ritual. The authors use soundshed tools within the Archaeoacoustics Toolbox to illustrate the extent of this performance space and the interaudibility between various locations within Downtown Chaco. Architecture placed at liminal locations may have inscribed sound in the landscape, physically marking the boundary of performance space. Finally, the implications of considering sound within political theater will be discussed.

17 SOUND COMMUNICATION IN NON-REVERBERATING ACOUSTICAL SPACES

Author(s): Kolltveit, Gjermund (Independent)

Presentation Format: Oral

Acoustic spaces or sound spaces are natural or man-made structures used for sound, or with sound as an integral part of religious ceremonies, gatherings or feasts. As shown in an increasing number of archaeoacoustic studies, some of these designated spaces, such as caves, megaliths – and later – theatres, churches, halls and other man-made structures, are used or constructed specifically because of their acoustic properties.

However, in many situations and places, people could neither make benefit from architectural structures nor natural spaces for acoustic communication. Some natural environments are especially unsuitable or demanding for communication purposes, with few hard surfaces that naturally reverberates and amplifies sound waves. People have therefore made use of certain techniques or specially designed contrivances of for communication purposes. One such place is at sea or in costal landscapes where the ocean and/or wind is the “keynote sound” of the soundscape.

In a ship excavated in Kvalsund, Sunnmøre, on the west coast of Norway, the archaeologists found a wooden funnel-shaped 72,5 centimetre long object, interpreted as a megaphone. The ship, which probably was a seagoing vessel, was dated to the 7th to 8th century AD. Based on reconstructions and experiments, this paper will discuss the acoustical function of the possible megaphone. It will also discuss other methods of communication at sea – with sound producing devices, or with other means, such as the whistling language used in whale hunting by the Siberian Yupik people, south of the Bering street.

18 FROM ORDINARY TO LIMINAL SPACES: SOUNDSCAPES AND TRANSFORMATION IN THE IRISH LANDSCAPE

Author(s): Primeau, Kristy (SUNY Albany) - Shaffer Foster, Jennifer (Medaille College) - Witt, David (SUNY Buffalo)

Presentation Format: Oral

Recent developments in Geographic Information Systems (GIS) tools are allowing researchers to determine how sounds propagate throughout a variety of landscapes. By utilizing these tools to model “soundsheds”, the authors explore how raths, Early Medieval Irish domestic sites, were reused and reinterpreted in the 19th and 20th centuries, and how sound potentially played a role in their transformation from ordinary to liminal spaces.

Raths are defined as circular enclosures demarcated by an earthen wall or walls and a ditch, which once contained houses, out-buildings, and livestock pens, and were home to multiple social classes. Over 30,000 raths survived into the modern era across Ireland, despite often being located on prime agricultural land. Their survival is due in part to the belief that they were home to the Sí, or fairies, and many raths are still known colloquially as “fairy forts.” The fairies were mischievous and malevolent creatures to be appeased or, ideally, avoided at all costs; therefore raths were eschewed as well. Additionally, raths were sometimes reused as cillíní, burial grounds for unbaptized children—a practice that continued until the mid-20th century. These two conceptualizations illustrate different ways of interacting with liminal spaces.

Thus, movement through the Irish landscape in the 19th and 20th centuries was mediated by the location of raths, whether homes to fairies or reused as cemeteries. The authors approach the liminal position of raths in the landscape via phenomenology, considering whether sound played a role in their status as places that were off-limits and removed from society.

19 ENCLOSING SOUND AND ENCOURAGING SONG: THE CONFLICTING SOUNDSCAPES OF A VICTORIAN LUNATIC ASYLUM

Author(s): Fennelly, Katherine (University of Lincoln)

Presentation Format: Oral

This paper will focus on the sonic environment of the historic lunatic asylum. The improved or reformed lunatic asylum of the early-nineteenth century was a carefully controlled space. The asylum building was designed and ordered in such a way as to separate noisy patients from those in advanced stages of recovery, while the material environment was carefully managed so as to minimise the building’s institutional nature. This paper will examine alterations in the physical layout of asylums in the later-nineteenth century in response to expansion and changes in management practice. This paper will focus on a single case study, the Lincoln City Asylum, later The Lawn, in the United Kingdom as an example of the site type. Through the examination of new additions to Victorian asylums, such as halls for entertainment and the installation of padded rooms, this paper argues that the soundscape of the asylum continued to be carefully controlled into the early twentieth century, even as the buildings were modified to accommodate specialised technologies and new forms of leisure activities. In the redevelopment of these sites in the twenty-first century, the former are frequently removed, while the latter form the centrepiece of public engagement. In the post-asylum era, those features of the historic lunatic asylum which represent its sonic environment have come to represent a popular impression of the best and worst of nineteenth-century asylum management.

a. AURALIZATION OF KUKULCAN TEMPLE'S SOUND EFFECT "THE QUETZAL TAIL" THROUGH ITS HISTORICAL RECONSTRUCTIONS; AN INTENTIONALITY ARGUMENT

Author(s): Chagoya, Servando - Ramos-Amézquita, Alejandro - Ramírez, Alexandra (Instituto Tecnológico y de Estudios Superiores de Monterrey)

Presentation Format: Poster

It wasn't until a few years ago that Mexican Archaeological site acoustics and their sound effects were studied within Acoustical Engineering procedures. The Temple of Kukulcan in Mexico, at Chichen Itza, has been of particular importance. The sound characteristics of the well-known sound effect - "La Cola del Quetzal" - have been a recurrent subject of study and several different sound generation mechanisms have been proposed. However, is not yet clear whether the original builders incorporated this phenomenon to their cultural practices, or if they were even aware of its existence. Nowadays, with the use of new technologies such as computer modelling and auralization, it is possible to better understand how architectural manipulation can have significant effects on the acoustics of archaeological sites. This can provide further evidence regarding the level of awareness that original constructors could have had of certain acoustical properties. It is known that the Kukulcan temple at Chichen-Itza, was built on top of a previous structure 500 years older. While there were significant changes on the construction, there are some remarkable features that remained unchanged, such as the inclination and general proportions of the staircase, structure responsible for the chirped echo known as the "Cola de quetzal". In this paper, through the use of acoustic modelling software (EASE), two 3D models will be created, based on the real dimensions of both actual and the previous Temple of Kukulcan structures, acoustic simulations and auralization are created in order to analyze and compare their acoustic behavior depending on the architectural features. This, we consider, will provide experimental supporting evidence to the intentionality discussion of one of the most celebrated archaeological sound effects, and therefore it will bring further insight to the design and construction capabilities of the Mayan-Toltec civilization and their use of special effects in cultural manifestations.

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TOWARDS AN ARCHAEOLOGY OF PEASANT AGENCY: DIVERSITY AND SCALE IN THE LONG DURATION

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Tejerizo, Carlos (Institute of Heritage Science, CSIC; Universidad Nacional de Catamarca) - Quirós, Juan Antonio (University of the Basque Country) - Tente, Catarina (Universidade Nova de Lisboa)

Format: Regular session

Since the beginnings of agriculture, societies based on their relation to the land have expanded and created a wide range of responses to the specific historical, geographical and cultural contexts. The aggressive expansion of modernity has led these societies towards a process of change that may result in their disappearance. Since the 1990s different social and political entities have increasingly sought to understand the effects that this process will have upon peasant societies worldwide. Although archaeology has functioned as a major tool for understanding (and colonizing) peasant societies, it has paid little attention to them as active agents in the transformation of social and political landscapes. On the contrary, they are commonly seen as passive subjects in a top-down perspective determined by the agency of the dominant classes or ecological phenomena. However, archaeology may function as an adequate framework to point out not only the inner dynamics of peasant societies, but also their capacity to actively interrelate with the landscape. How peasant societies materially express their agency? How does equality or inequality affect their social dynamics? How they interrelate with other social groups? This session will reflect on the possibilities and limits of an archaeology of peasant agency in the long duration, trying to connect case studies through time and space. This session welcomes papers dealing with: Critical theoretical approaches to peasant societies and agency; Social inequality within peasant societies and their relation with different social groups.

ABSTRACTS

01 AN ARCHAEOLOGY OF PEASANT AGENCY: A THEORETICAL APPROACH

Author(s): Tejerizo, Carlos (Institute of Heritage Science, CSIC)

Presentation Format: Oral

Peasant societies and their political and economic agencies have been at the centre of attention of disciplines like Anthropology, Sociology or Demography. These discussions have deeply influenced the archaeological approaches on the topic since its very beginning. Needless to say that the introduction of the major works of scholars such as A.V. Chayanov, E. Wolf or C. Meillassoux have inspired a lot of archaeological work on these type of societies, providing stimulating new ideas to better understand them and their complexities. However, contrary to other disciplines, in recent years archaeological research has paid little attention to peasant societies even though its importance in the global political agenda. One of the causes for this situation is the stagnation of theoretical thinking on the archaeology of peasant societies. In this introductory paper for the session on the archaeology of peasant agency, I will propose some theoretical thoughts and discussions taking into account the last insights on the issue, like the work of M. Kearney

on post-peasantries, the developments on peasant studies in Latin American since the 90s or the recent discussions in northern Europe. I will also consider some of the cutting-edge archaeological approaches and researches from a global perspective on the topic.

02 PEASANT ECONOMIES IN THE NORTH OF ROMAN CARPETANIA: LIVING CONDITIONS, NETWORKS, AND INEQUALITY

Author(s): Bermejo Tirado, Jesús (Universidad Carlos III de Madrid)

Presentation Format: Oral

This paper will focus on the presentation of the methodological perspective adopted and the first (and partial) results obtained from the research project “Economías domésticas en la Carpetania romana (s. I a. C. - IV d. C.): condiciones de vida, redes y desigualdad”, funded by the Research Council of the Autonomous Community of Madrid.

Following the steller of recent European projects on the study of Roman rural areas of Britannia (Fulford et al. 2016) and in the North-east Gallia (Reddé 2017), this project include the analysis of 22 peasant sites excavated as the result of diverse emergency interventions in the Madrilian metropolitan area. Thus, as an unexpected consequence of the Madrilian unbridled urban development of the pre-crisis period, we are gathering a huge quantity of archaeological data from a type of rural sites that has received little attention by previous Classical Archaeology scholarship in the area.

Finally, we will explain how the application of a “Household Archaeology” methodological perspective to the analysis of selected deposits can serve us to rethink our current conceptions on the social and economic structures of the rural communities of Roman Carpetania. In doing so, we aspire to make the North of the ancient Carpetania a key case-study for the knowledge of peasant communities of the Roman period.

03 RURAL LANDSCAPES IN THE QUEILES VALLEY BETWEEN THE IRON AGE AND LATE ANTIQUITY (SPAIN)

Author(s): Bonilla Santander, Oscar (Universidad de Zaragoza) - Serrano Arnáez, Begoña (Universidad de Granada)

Presentation Format: Oral

The configuration of rural productive landscapes in antiquity has traditionally been studied from a marginal position and centered on issues of identity, leaving aside the central axis of the peasant landscape: production and class issues. The Queiles Valley is a territory articulated by the river Queiles and its tributary the Val River, which rises in the Castilian plateau next to Ólvega and flows into the Ebro river in the city of Tudela. A territory in which there are landscapes of mountain and plain and that constitutes a road that unites the valley of the Ebro with the Plateau. In this paper we will expose how this space configured in the Iron Age as a territory structured by castros inhabited by egalitarian agrarian societies will be disarticulated by the interaction of the Roman colonial model, configuring an unequal and constantly changing rural reality. The Roman conquest of the territory and the subsequent transformation of the rural landscape with the construction of infrastructures will transform the structural bases of peasant production and reproduction combining in the same territory productive units dedicated to production for survival in the face of productive realities directed to production for the regional market. With the disappearance of the imperial structures, the rural landscape will break down when the structural structures of the Roman model are broken, turning this territory into a marginal space.

04 INNOVATION, RESILIENCE AND RISK MANAGEMENT – FOREST PEASANTS AND THE MARKET

Author(s): Svensson, Eva (Karlstad University) - Lindholm, Karl-Johan (Uppsala University) - Eriksson, Ove (Stockholm University) - Löwenborg, Daniel - Ekblom, Anneli (Uppsala University) - Ersmark, Erik (The Swedish Museum of Natural History)

Presentation Format: Oral

The new interdisciplinary project “Contesting Marginality” is investigating the role of Scandinavia’s forested inland in the larger historical developments that took place in northern Europe in the Iron Age and the Middle Ages (AD–1500 AD). Current research indicates that an increasing amount of goods produced in the forested region accumulated in the early central and urban places, discoveries that challenge conventional understandings of the inland region as a periphery.

We forward the hypothesis that from early first millennium AD innovative, active and knowledgeable communities of the forested inland were socially and economically integrated into systems of trade and interaction with the worlds outside, which in turn became crucial components for Viking Age and early medieval state formation processes and early urbanisation.

Preliminary results indicate that the forest peasants, through socio-ecological strategies, had the capacities for creating resilient communities and coping with risks. In this paper peasant driven colonization into the forested outlands for exploitation of various resources will be presented with focus on how the peasants created structures and institutions for agrarian as well as outland based commodity production. Examples will be given on how different innovative socio-ecological strategies, involving smart organisations based on communality, versatility and seasonality, were constructed and restructured when facing challenges such as settlement colonization in harsh environments, engagement with the market and risk management.

05 UPLAND FARMING IN IRELAND AND SCOTLAND: THE INTERACTION OF NON-ELITE PEOPLES WITH AGRARIAN CAPITALISM, AD1450-1850

Author(s): Costello, Eugene (National University of Ireland, Galway)

Presentation Format: Oral

This paper compares the experiences of non-elite farming communities in upland areas of Ireland and Highland Scotland during the emergence of agrarian capitalism, c.1450-1850. Culturally and environmentally, Ireland and (Highland) Scotland are seen to share a number of traits in the popular imagination. Irish and Scottish Gaelic are very closely related and were spoken almost universally in rural areas up to the 19th century. Furthermore, much of the west of Ireland is characterised by expanses of peaty upland, which resembles the Highland landscape. The experiences of rural dwellers in these countries was not the same during the recent past, however. In the 16th and 17th centuries, much of south-west Ireland became exposed to an international trade in dairy produce while demand for beef and wool appears to have been more significant in Scotland. Slightly later, in the late 18th and early 19th centuries, the Highland Clearances started in Scotland, with people often making way for specialised sheep farming and eventually deer and grouse. Over the same period, rural landscapes in Ireland experienced massive population growth. None of these established historical narratives take the agency of local non-elite people into account, however. This paper uses a long-term historic landscape approach to examine how peasant farmers mediated between political and environmental realities in order to interact with new economic trends, even where they inhabited landscapes that are now perceived as marginal. Using archaeologically-informed case-study material from the Galtee Mountains and the central Scottish Highlands, I argue that we cannot truly understand the decision-making of elite landowners if we do not first characterise the agency of their subjects. Likewise, we must accept that the participation of peasant farmers in wider economic trends was influenced to a certain degree by more powerful classes.

06 A MONTANE THEATRE OF PEASANT LABOUR: THOUGHTS ON PEASANT AGENCY IN THE CULTURAL LANDSCAPE OF ZAGORI (16TH - 19TH C.)

Author(s): Moudopoulos Athanasiou, Faidon (University of Sheffield)

Presentation Format: Oral

Peasants play an important role in the economy of the Ottoman Empire. They are key agents in the process of sustaining the economy through field cultivation, which in turn generates a great amount of taxes payable to state treasury, military officers or local elites. Cultivating land within the *çift-hane* system, under tax-farmers in the *malikâne* system or being *çiftlik* sharecroppers, their relations, itineraries and routines within the landscape are the backbone of the economy.

In 1998, Fikret Adanir, while reflecting on Ottoman peasantries, expressed the opinion that because of elite-biased archival limitations, bottom-up perspectives are lacking from the discourse. Indeed, peasant agency is to a certain extent absent from the wider debates. Archaeology is a tool to alter the above perception by recording the traces of peasant activities left in the landscape. Being in constant dialogue with the sources it has the potential to offer information on how peasants shaped their landscape to achieve subsistence and cope with taxation.

This paper will reflect on peasant agency using the mountainous Zagori, Northwest Greece as a case study (16th to 19th c.). The Zagori network of sedentary villages, situated in the Pindhos mountain-range, created a culture that shaped the landscape according to the needs of cultivation and other practices related to agriculture.

Sustaining such an agricultural landscape is a laborious process, performed by members of households, aiming to survive harsh winters and Ottoman taxation. Using the first results of my PhD research, combining local archive investigation with landscape archaeology, this paper will try to address the issue of peasant agency in a marginal mountainous area of the Ottoman Balkans.

07 'HAPPY UNDER THEIR OWN CUSTOMS': RUNDALE LANDSCAPES AND COLLECTIVE AGENCY IN THE POST-MEDIEVAL WEST OF IRELAND

Author(s): Campbell, Eve (Achill Archaeological Field School)

Presentation Format: Oral

Although often framed as a 'wild' and 'timeless' place bypassed by the currents of modernity, the landscapes of Ireland's western counties owe much to dramatic transformations that took place in the mid-19th century, and especially after the Great Famine (1845-52). These transformations focused on dismantling customary collective landholding practices, known to contemporaries as 'rundale', and implementing regimes premised on individual ownership and rooted in the ideologies of agrarian capitalism. Rundale is a term applied to a form of co-operative farming system that accounted for some 8% of Irish land ca.1845, largely in the western half of the island on the Atlantic littoral. While exhibiting regional diversity, it had a number of common characteristics including open-field agrarian systems based on infield and outfield, village clusters, partnership tenure, and local institutions of resource governance. Typically located in agriculturally marginal land, often with high levels of autonomy and minimal landlord intervention, yet enmeshed in global economic webs, rundale communities developed variegated subsistence strategies based on seasonal use of the landscape and selected engagement with the market economy. Drawing on case studies from counties Mayo and Clare, in the west of Ireland, this paper outlines an archaeology of rundale, exploring how the spatiality and materiality of rundale landscapes express a collective agency and vernacular logic largely illegible to contemporary state officials or agricultural improvers. The paper concludes by considering the break-up and enclosure of rundale villages and evidence for resistance to the process.

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Nieuwhof, Annet (University of Groningen) - Kegl, Jan (Ostfriesische Landschaft, Aurich) - Campbell, Louisa (University of Glasgow)

Format: Regular session

Roman conquest clearly had a tremendous influence on the peoples that were incorporated into the Roman Empire. But the proximity of this expansive colonial regime must also have had an enormous impact on indigenous societies in frontier regions or beyond Imperial boundaries, particularly those with less hierarchical social structures and without standing armies. Roman power and culture undoubtedly aroused curiosity and fascination but also fear and aversion, sometimes resulting in more or less successful resistance.

Discussion and research on changes that occurred in these societies during the Roman period have long been dominated by the perspective of Rome. Roman authors were consequently taken as reliable and unbiased primary sources of information with Roman colonial discourse emphasising the warlike attitude of 'barbarians' and the benefits of the Pax Romana uncritically adopted by academics without the application of modern theoretical constructs.

In this session we consider the indigenous populations who came into contact with the Romans and focus on evidence from archaeological rather than historical sources. What can we learn from material culture about the processes that occurred outside the Roman Empire or in frontier contexts? How was indigenous material culture influenced by Roman material culture or vice versa? Can we identify social, cultural or material changes resulting from contact with the Roman Empire? What was the character of these contacts and how can we explore alternative perspectives in cultural contact contexts?

We invite papers that explore and discuss these and similar questions.

ABSTRACTS

01 LUXURY TABLEWARE? TERRA SIGILLATA IN THE TERP REGION OF THE NORTHERN NETHERLANDS

Author(s): Nieuwhof, Annet (University of Groningen)

Presentation Format: Oral

With thousands of finds, Roman terra sigillata (TS) is a rather common find category in terp settlements of the Northern Netherlands. It is traditionally interpreted as luxury tableware of the local elites, who acquired it through their contacts with Romans, or who were able to buy it from traders who came to this area with their merchandise.

Research of the last few years, however, has questioned this interpretation. The reason is that, although there are a few complete bowls, the far majority of TS is found as sherds, which, despite their good recognisability, only rarely fit other sherds. Moreover, many of these sherds are worked or used in some way. They were made into pendants, spindle whorls and playing counters, or show traces of deliberate breakage and of use for unknown purposes. Such traces are found on 70-80% of the sherds. There are striking parallels for such use in early modern colonial contexts.

The meaning of TS seems to have been symbolic rather than functional. It seems that, rather than as luxury tableware, TS may have been valued for the sake of the material itself, and may have been imported as sherds rather than as complete vessels. This value also shows from its long-term use. Used or worked TS sherds from the 2nd and 3rd century AD are often found in finds assemblages that may be interpreted as ritual deposits, not only from the Roman Period but also from the early Middle Ages.

02 LATE ANTIQUE FORTS AT THE CONFLUENCE OF THE NILES

Author(s): Drzewiecki, Mariusz (Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences)

Presentation Format: Oral

The confluence of the White Nile and the Blue Nile is where the largest cities of Sudan are located (Khartoum, Omdurman and Bahri). On the northern outskirts of Omdurman, there are remains of three regular forts investigated recently by the author. They are dated to the late Antique period. The forts constitute the southernmost end of a chain of fortifications built in the Middle Nile Valley. The chain is approx. 550 km long and starts in the Fourth Cataract Region and ends at the confluence. It consists of altogether 11 fortified sites which resemble regular small forts built across Roman Empire.

The late Antique period in the Middle Nile Valley was when Meroitic rulers lost their influence and the region was taken by Nubians who constituted new kingdoms. The period saw conflicts which included Axumite armies and nomadic peoples. Roman influence was strong in the region. Nubians and nomadic Blemmyes living next to the Roman frontier at the First Cataract were made foederatus. This is well confirmed in written sources and by archaeological finds from elite graves of the period.

Is the chain of forts another sign of close relationships with Roman Empire? Did Romans provide aid sending their specialists? Where the forts built under the supervision of Roman engineers? If yes, then more similarities with Roman forts should be expected upon closer examination. To explore the subject, first, a detail architectural analysis of the Middle Nile forts was conducted focusing es-

pecially on a comparison of the forts metric systems. Then, secondly similar Roman forts were sought and compared in more detail. The results of the analysis will be discussed during the presentation.

03 TRANSFORMING THE FACES OF THE DEAD. USING R TO TRACE THE CHANGING BURIAL PREFERENCES AT HATRA AND PALMYRA

Author(s): Tietze, Carolin (ISAAKiel; CAU Kiel)

Presentation Format: Oral

A necropolis is the endpoint for every individual within a society and while a society is subject to certain behavioral patterns, the necropolis is too. This indigenous society will also develop certain traditions, like the placement of a funerary monument and its orientation within the necropolis, the way the dead were buried and how the monument was decorated. But what happens when you introduce a foreign influence? Will the indigenous traditions change, mix or be overwritten?

Palmyra and Hatra, two trading cities of the near eastern provinces, were within reach of the Roman empire but at the same time still without direct and constant contact to the conqueror of their surrounding cities. An analysis of the initial preferences for the way their necropoleis were structured and which factors were implemented into a choice of funerary monument type, placement, decoration or inscriptions will show a pattern which can then be compared to the patterns of the same society after the point of influence. Research environments like R and GIS can help trace and understand these changes by using point-pattern-analysis and similar methods, while also providing a way to create reproducible research. The results of this analysis will show the degree to which an indigenous tradition has been altered, how much of it was kept and when the change started. Approaches like these will allow much more dependable groundwork for discussions about cultural transfer and such, since they depend on the indigenous material culture and not on biased academical opinion aiding contemporary theoretical constructs.

04 ROMANIZATION OF LOWER DANUBE. MEANINGS AND ARCHAEOLOGICAL DATA

Author(s): Magureanu, Andrei - Magureanu, Despina (Institute of Archaeology „Vasile Parvan“)

Presentation Format: Oral

The Roman World was viewed as a modern and attractive one for the barbarians (as non-Romans) living in the North part of Lower Danube, at least by modern archaeologists. We count the “imports” and “influences” of Romans into Barbaricum, but did the Romans consciously change the way of life of the barbarians? Was there a state policy of acculturation? Was it a deliberate process before and after the conquest? Did the barbarians accept the Roman culture as a chance for a better life? Was this a large-scale process or a personal choice? Was using Roman attributes like costume, religion or life style about being Roman or about personal power or social

status? Was this process of Romanization a consequence of the relation between Romans and ‘barbarians’? Or it was just a way of affirmation between Barbarians only, as part of their social competition? Unfortunately we have written evidence only from Roman writers. Nothing from the perspective of the indigenous people, at least in the studied area.

We intend to debate this issue of Romanization based on three sets of data: firstly from the area before the Roman conquest, secondly from the Roman Period and thirdly from this area after the roman withdrawal, but still with Roman presence in the border area, the limes being a place for cultural exchanges.

05 FRIEND OR FOE? BARBARIANS IN THE UPPER TISA BASIN IN THE 3RD AND 4TH CENTURIES

Author(s): Bulas, Jan (Jagiellonian University)

Presentation Format: Oral

In the aftermath of the Marcomannic Wars, the relation between the Empire and the population of barbarians living in the Upper Tisa Basin changed. The newcomers – The Vandals settled in this region and probably played an important role in the conflicts of the end of the 2nd century and in shaping the new political and economic role of the region. While the ethnic situation and the mutual relations between Dacian, Sarmatian and Germanic tribes are not clear, one cannot question the demographic explosion demonstrated by the numerous settlement sites.

This paper aim is to present the study of the process of the cultural change that took place in the Upper Tisa Basin in the younger and late Roman period. Previous excavation from the region analysed in the new perspective will be presented as well as new discoveries. The analysis of the material culture indicates strong links between Roman and barbarian societies inhabiting this region, located almost between provinces – Pannonia and Dacia. Archaeological materials found both on the settlements and burial grounds show a huge economic and social impact of the empire on Germanic tribes. This influence has left its mark on this military society which is demonstrated not only by material culture. However, it should be emphasized that the cultural influence was not one-sided. While the influence of the empire on the people living outside Limes is often taken for granted, it is far more difficult to demonstrate how the Germanic tribes influenced the Roman way of life.

06 WHAT CAN WE LEARN FROM OUR RIVALS?

Author(s): Narloch, Krzysztof (Uniwersytet Warszawski)

Presentation Format: Oral

The history of the Romans is mostly a history of conquest and attempts to subjugate various populations. Rome as the dominant side for most of the time was able to impose its political or social order and its culture. Despite the powerful asymmetry in these relations, the culture of the Barbarians also influenced the Romans. This situation has been very dynamic over the centuries, but unique in this respect is the period of the fourth and fifth centuries, when the conquests had almost completely stopped, but the war still broke out. During this period, the main opponents of the empire were Persia in the east and barbaric populations from the north. Intensification of contacts, including military ones, with these rivals took place in different times, which is reflected in material culture, and especially in armaments.

The two main purposes of this speech are to track changes in the armaments used mainly by the soldiers in the service of Rome as a result of contact with the Barbarians. Showing this issue in the broader context of socio-political changes, and thus attempt to answer why certain patterns have been adapted and have become a kind of universal symbols, especially in border areas.

07 ILLUMINATING THE SHADOW: COINAGE AS A TRANSFORMED AND TRANSFORMING MEDIUM BEYOND THE LIMES

Author(s): Wigg-Wolf, David (RGK - Romano-Germanic Commission DAI)

Presentation Format: Oral

Tacitus' famous lines on the (non)-use of Roman coinage in Germania (Germ. 5, 3-5) has long been a cornerstone of the interpretation of how the peoples living to the north of the Limes employed Roman coins. It is reflected in Barry Cunliffe's "Europe between the Oceans" (fig. 11.17), in which he divides the northern Barbaricum into Market, Rich Burial and Warrior Burial Zones based on distance from the Rhine/Danube frontier.

However, with the publication of extensive corpora of finds of ancient coins, in particular from Germany, a new picture is emerging that is very different from that of divergent usage by the proximi and interiores of Tacitus. As a combination of material, text and image, as well as a medium that moved from the official milieu of production to the everyday environment of circulation, coins can throw light on a wide variety of aspects of the meeting of Rome and her northern neighbours. Drawing on the data from a comprehensive survey of coin finds from northern Germany, this contribution will consider the reasons and mechanisms of the influx of Roman coin into the northern Barbaricum; the ways in which the function of coinage and coins, both as monetary and non-monetary objects, could be transformed upon entering the new milieu; and the ambiguous role coins as originally unambiguous Roman objects that prominently displayed the head of the emperor played in the expression of identities in a "non-Roman" (?) society.

08 METALS AND WHEEL-THROWN POTTERY: ROMAN IMPORTED MATERIAL IN THE WESTPHALIAN HINTERLAND

Author(s): Cichy, Eva (LWL-Archäologie für Westfalen) - Könemann, Patrick (Ruhr Universität Bochum) - Fahr, Robert (LWL-Archäologie für Westfalen)

Presentation Format: Oral

During the last years several studies to different aspects concerning Roman material goods in westphalian sites have been carried out:

- The non-ferrous and precious metal finds of Kamen-Westick, one of the most important Imperial-period sites have recently been analysed with particular interest on metal processing. Roman metal imports were used for an indigenous production of non-ferrous products as besides the scientific results of examination finds as a mould for belt Mounds and metal vessels with incision marks prove.
- Studies to the imported pottery from Westick contribute new aspects concerning the chronology of this site and the very special choice of types.
- New scientific studies on late Terra Nigra foot-vessels suggest not a Roman origin but a large production in the Westphalian Hellweg-Region besides another major production in the Netherlands.
- Evidently lead mining was initiated by roman operators during the occupation in westphalia. In the area of Soest indigenous metal-workers were involved in processing the lead. Finds verify contact of the local inhabitants to Roman merchants and a certain wealth. In mid-century the Situation changed, Roman Import declines and settlements are abandoned. But finds in the North Sauerland are indicative of further indigenous usage of the resources: nearly daily new finds of Roman lead ingots change our mapping of their distribution.

09 WESTERHOLT "AN DER MÜHLE" - A ROMAN IRON AGE SITE AT THE NORTH SEA COAST

Author(s): Kegler, Jan (Ostfriesische Landschaft)

Presentation Format: Oral

A Roman Iron age settlement situated in Westerholt was excavated/ by the heritage management of the Ostfriesische Landschaft

between the years of 2001 and 2016. The site is to date the largest settlement area from this period excavated on the East-Frisian peninsula. The finds belong to the 1st to 5th century A.D. The sheer size of the settlement helped to establish a general insight into its overall structure and revealed a cluster of several houses at its center that combined living and livestock accommodations under their roofs. These houses seem to have been renewed during several generations. A large area of pits, which may be assigned to extensive clay retrieval for building, was documented near the houses. The settlement pits, wells and only few graves held plenty of ceramic finds but also some remarkable, less common items such as parts of leather shoes and turned furniture. Many of the smaller finds are obviously Roman import goods. They may well indicate that the settlement of Westerholt belonged to the widespread exchange network that marked the contact routes along the Northern Sea. The settlement can be compared to neighbouring coastal areas, where similar occupation during the Roman Iron Age can be attested; the interpretation of the settlement, however, is still uncertain. Was it a central site of a local elite, or just a settlement that produced mainly for its own needs, or both?

10 ROMAN IMPORT FOR THE BARBARIANS OF THE NORTH - GRAVE GOODS AND BUILDING PRACTICES

Author(s): Jensen, Anja (Museum Skanderborg)

Presentation Format: Oral

At the outmost edges of Barbaricum, the movements of the mighty Roman Empire were carefully observed. Around 150 BC in Denmark, a change in village structures appears, which suggests increased stratification in society. For example, villages with the presence of farms, which is significantly larger than the other surrounding farms, appear. A significant change is also noticeable in burial customs. Where previous Iron Age burials have been quite modest, graves with exquisite imported objects now appear. In the southern part of Denmark, trade centres emerge, and onto these localities, various objects from the Roman Empire were imported. These objects were distributed among the ruling class, and played an important part in sustaining power balances.

Museum Skanderborg has conducted an excavation at a settlement from the Iron Age (1-150 AD), which in its outline and house-building exhibits features and symmetry that is highly unusual in Danish settlements from this period. In addition, a handful of very rich burials from the same period have been found, just a few hundred meters south of the settlement. These graves contain the traditional Danish Iron Age funerary element, which is locally made pottery in various shapes and sizes, but also imported Roman luxury items such as a bronze wine strainer set, glass beads and even a mirror.

This presentation draws the headlines of the excavation results from the settlement and gives an introduction to the imported items from the graves. The results addresses these questions: Why does the settlement significantly differ from other settlements from the same period in time? Which types of items were imported and which signal values did the import have to convey?

11 ROMAN KNIGHT AND GOTLAND?

Author(s): Gannholm, Tore (Åbo akademi)

Presentation Format: Oral

The Roman writer Pliny, who died in the destruction of Pompeii in 79 CE talks in his 37th book about a Roman knight who during emperor Nero visited the Amber Coast on the Baltic Sea and brought home large quantities of amber. He talks about 'commercia', venues where the amber was gathered and where commerce was conducted. We can assume that those venues for the most part were located at the estuary of the Vistula, where we also find Gotlandic trading Emporiums. During the time of the Emperors these trading Emporiums were visited by merchants from the Danube provinces and Quadii country, who came to buy raw amber. This amber was transported along a well-organized trade route over the Vistula and the Oder outlet areas through the Moravian gateway and further to Carnuntum at the middle Danube, reaching the sea at Aquileia, which was famous for its amber workshops. The Amber Knight, as he is called in the literature, according to Pliny also visited the major venues in the Baltic Sea region.

If this Roman makes a trip to the Gotlandic commercial Emporiums on the Baltic Sea coasts, he obviously does not avoid visiting the trade center in the middle of Mare Suebicum, namely Gotland, which already at that time was considered to have been the center for trade in the Baltic Sea region. Tacitus description is quite clear here. He says, you go straight out from the Vistula estuary to meet the powerful people in the Baltic Sea. From there it is due east and you come to the Baltic Sea coast. Already in the early Iron Age we know that the Gotlanders had trading emporiums there and professor Birger Nerman believes that the Gotlanders were the mediators of culture and commerce to the rest of the Nordic tribes.

12 VESTLAND CAULDRONS WITH CREMATION RESIDUES: ENCOUNTERS IN A LOCAL SCANDINAVIAN MICRO PERSPECTIVE

Author(s): Hjørungdal, Tove (University of Gothenburg)

Presentation Format: Oral

Vestland cauldrons produced in Germania Inferior were frequently used with cremation residues during the Roman Iron Age and the Migration period in Scandinavian contexts. A local and comparative approach has brought a number of nuances to be detected in the material. This concerns changes in the cauldrons themselves as well as details in the burial constructions they comprise. Examples are given from North Sweden and from Western Scandinavia, the latter with the majority of the burials. Small material changes have been noticed in cauldrons and in burials, and also imitations of provincial items in different materials are present. All of these material traces are tactile expressions of far reaching and changing contacts, encounters and mutual influences far beyond the frontier of

Limes. For example are extra handles added locally to the cauldrons, and they have frequently been extensively mended several times. No direct contact with Roman area is supposed, but the cauldron material shows signs of how an item can travel far away through centuries, be repeatedly mended, and be transformed over geographical distances. The Vestland cauldron is supposed to have been transformed from military canteen to burial urn. Much is written on Vestland cauldrons, but a micro study and new questions have revealed still new details on the cauldrons, their surroundings as well as on the arrangements they are part of.

13 WHAT DID THE ROMANS DO FOR US? SOCIO-JUDICIAL CHANGES IN SCANDINAVIA IN ENCOUNTER WITH THE ROMAN EMPIRE, C. 100-600/1000 CE

Author(s): Ødegaard, Marie (Museum of Cultural History, University of Oslo)

Presentation Format: Oral

This paper will investigate the socio-judicial changes that occurred in the Germanic societies of Scandinavia in the period c. 100-600/1000 CE. The Early Iron Age Germanic societies north of the Limes were warrior societies in which war and religion were inseparable. Within a few hundred years of the first encounters with the Romans in these areas during the last century BCE, social, economic and political changes can be traced within Scandinavia. This is reflected in grave- and settlement patterns and reorganisations of the farming system. After c. 200 CE the landscape evidently underwent large-scale restructuring to increase surplus production. This must have required an active leadership, most likely by an elite with acceptance by the collective. Such collective decisions were probably taken at regular meetings, which potentially can be traced in the form of so-called specialized cooking-pit sites of south-east Norway and court-yard sites of southwest- and mid-Norway, who gathered momentum in use in this period. Central questions for the paper are what these large-scale gathering sites can reveal about the social, cultural, and material results of the contact and establishment of networks with the Roman Empire in the first six centuries of the Common Era. The archaeological traces of large-scale meeting sites will be used as a source to discuss socio-judicial changes and continuity in a long-term perspective. It will be argued that influences and imminent threats from the Roman Empire led to social hierarchisation and in turn an increased legal organisation and a regulation of the landscape in Scandinavia.

14 OUTSIDE THE LIMES: POSSIBLE INTERACTIONS BETWEEN ROMANS AND NATIVES OF SCOTLAND

Author(s): Di Pastena, Luisa (Università degli Studi di Roma "La Sapienza")

Presentation Format: Oral

Was Hadrian's Wall just a barrier to separate Romans from barbarians? Could contacts between Romans and natives beyond the frontier exist instead? Opinions on the processes that occurred at the time are progressively changing in recent times, due to several elements to which new researches are pointing. First of all, the presence in some milecastles of causeways leading northward and the existence of real roads crossing the lands of Scotland clearly suggest the possible existence of more or less intense trades through the frontier.

As far as recent excavations demonstrate, Samian ware, glass cups or bowls, melon beads ornaments, bronze objects like paterae or fibulae reached the native settlements from the southern lands. Traprain Law is the most famous site in which Roman objects were found, but it is necessary to try to understand what can be found also in different and less-known sites. Nevertheless the exchanges were not unidirectional: "barbaric" objects like knobbed terrets, torques, local coarse ware, weapons and even oyster shells caught in the Firth of Forth, found in military contexts, demonstrate the birth of an interest for local productions and traditions.

When and on behalf of whom did this process start? Obviously the presence of the Roman army on the boundary and in the forts along the main roads crossing the Scottish hinterland might have caused a reciprocal approach; besides, the merchants themselves who followed the army wanted to take advantage of new trades, as an inscription from the fort of Maia (Bowness-on-Solway) suggest.

15 PROMOTING PROPAGANDA THROUGH EPIGRAPHY ON THE EDGE OF EMPIRE

Author(s): Campbell, Louisa (University of Glasgow)

Presentation Format: Oral

It is easy to imagine Roman Britain in monochrome since much of the material culture that survives for display in our museums derives from stone and metalwork devoid of colour. This is particularly evident on the Empire's northwestern Frontier, the Antonine Wall, where Distance Slabs were important media for promoting Roman propaganda through epigraphy and iconography. Some contain vivid, and often brutal, iconography of Rome's domination of submissive 'barbarian' prisoners, some depict deities, legionary emblems or religious ceremonies, while others contain zoomorphic or elaborately styled frames for abbreviated Latin text. Most contain a dedication to Antoninus Pius, the Emperor who commissioned the Wall, as well as a commemoration to the Legions that erected sections of the Wall upon which the stones were originally mounted and many include the distance constructed.

This paper challenges the perception of these iconic sculptures as static objects devoid of vibrant colours common in other contexts of Roman life. Recent non-destructive analysis of these and other statuary from Northern Britain suggests they would have been embellished with colour to reinforce and promote Roman propaganda. I will explore how these monuments might have originally looked as well as their reception and impact on both a Roman and non-Roman audience.

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Ting, Carmen (University of Cyprus) - Molera, Judit (Universitat de Vic - Universitat Central de Catalunya) - Salinas, Elena (Universitat Politècnica de Catalunya) - Vionis, Athanasios (University of Cyprus) - Gaudenzi Asinelli, Mainardo (Universitat de Vic - Universitat Central de Catalunya)

Format: Regular session

Glaze production is considered as a technological innovation reflecting the interactions among various groups that represented the East and West in medieval and post-medieval Mediterranean (c. AD 700 – 1750). As such, plenty of studies have been conducted on characterising the chemical and physical properties, and the fabrication techniques of medieval and post-medieval glazes drawing examples from the eastern and western Mediterranean. However, very few attempts have been made to compare and establish the link between the development of glaze production technology across both sides of the Mediterranean, even though these two regions experienced parallel socio-political transformations during this time period.

In an attempt to bridge this gap in the existing research framework, this session aims at addressing the following themes: (1) to explore the local patterns of glaze production technology and its implications for the broader historical developments; (2) to map the spatial and temporal trends in glaze production technology across both sides of the Mediterranean; and ultimately, (3) to delineate the processes and means through which technological knowledge and practice in glaze production was transmitted.

We welcome papers with focus on using interdisciplinary approaches in the study of glaze production technology in the medieval and post-medieval Mediterranean. We are particularly interested in papers that focus on the interpretation of compositional and technological data using anthropological theories (e.g. cultural transmission theory and network theory), and the application of new analytical techniques in characterising different aspects of glaze production.

ABSTRACTS

01 THE USE OF TIN- AND ANTIMONY-BASED YELLOW AND WHITE OPACIFIERS IN ISLAMIC GLAZED CERAMICS

Author(s): Tite, Michael (University of Oxford) - Salinas, Elena (Universitat Politècnica de Catalunya) - Pradell, Trinitat (Universitat Politècnica de Catalunya) - Matin, Moujan (University of Oxford)

Presentation Format: Oral

Lead antimonate and calcium antimonate were used to produce, respectively, yellow and white opaque glass in Egypt and the Near East from about 1500 BC onwards. Then, sometime during 4th century AD, they were replaced, respectively, by lead stannate and tin oxide in the production of yellow and white opaque Roman and Byzantine glass. Subsequently, following the Byzantine glass production technology, the first Islamic yellow and white opaque glazes were produced in Egypt and the Levant in the 8th century AD. From there, the tin-based glaze technology spread eastwards into Mesopotamia where the production of white opaque glazes, based on a different formulation, became dominant during the 9th century AD.

From 9th century AD Mesopotamia, the primary developments were the spread of the production of lead stannate opacified yellow glazes eastwards to Iran, Central Asia, and ultimately into India, and the corresponding spread of the production of tin oxide opacified white glazes westwards to Egypt, across North Africa, into Spain, and ultimately into Italy for the production of maiolica. However, in addition, in Egypt and North Africa during the 9th – 11th centuries AD, there was a switch to the use of lead antimonate in the production of Islamic yellow opaque glazes.

After a brief review of the development and spread of the production of Islamic tin-based yellow and white opaque glazes, new data on the compositions and microstructures of lead antimonate yellow opaque glazes from Egypt will be presented. The possible reasons for the switch to use of lead antimonate as a glaze opacifier will be considered, together with its possible link to the subsequent use of lead antimonate as a yellow pigment in the decoration of Italian maiolica ceramics.

02 THE BEGINNINGS OF TIN-OPACIFIED ISLAMIC GLAZES IN WESTERN MEDITERRANEAN

Author(s): Salinas, Elena - Pradell, Trinitat (Universitat Politècnica de Catalunya)

Presentation Format: Oral

Recent studies have revised the information available up to day about the beginning of tin-opacified Islamic glazed, proposing an Egyptian and Syrian origin (8th century), instead of an Abbasid Iraqi one (9th century) (Tite et al 2015; Watson 2014). This research has been based in diffusion of the lead stannate opaque yellow glazes through the eastern Islamic world.

However, until very recently, it was not known about the beginnings of tin-opacified glazes in the other side of the Mediterranean, in western Islamic lands. Although, it was generally accepted that the tin technology started later than in the Eastern and that the technological transfer came from there, it was not known where, when and how began to be produced.

After a brief review of what is known about the earliest tin-opacified Islamic glazes of the western Islamic lands (north Africa, Iberia

and western and central Mediterranean islands), we will present the earliest white tin-opacified glazes produced in al-Andalus from two archaeological contexts, dated in the late 9th-early 10th centuries. These tin opaque glazes are earlier than the Caliphate tin-glazed ware found at Madinat al-Zahra (939-1010 AD). We have analysed this material microscopically, by Scanning Electron Microscopy (SEM) with Energy-dispersive X-ray spectroscopy (EDS), X-ray diffraction (XRD) and Optical Microscopy.

03 NEW DATA FROM THE STUDY OF THE EARLY ISLAMIC GLAZED CERAMIC VESSELS OF MEDINA ELVIRA (GRANADA, SPAIN)

Author(s): Martinez alvarez, Cristina (University of Granada)

Presentation Format: Oral

The recent investigations developed around early Islamic town of Medina Elvira (Granada) have confirmed the importance of this site to understand how cities were formed in al-Andalus and the evolution of urban spaces in emiral and caliphal period in the south of Iberia. The aim of this work is to show the outcomes of the recent archaeometric analysis carried out in the glazed ceramics recover from a domestic rubbish-dump of the city chronologically dated between the second half of the 9th century and the end of the 10th century. Specifically, about six pieces of tableware (atafores and small jars) and some glazed lamps were analysed. All of them cover in different colours, and with or without decoration presented.

The final objective of this study is to present the preliminary results of the analyses carried out on glazed ceramics from this context using for the characterization of the chemical composition of the matrix-glazed interfaced, of the glazed decoration and of the matrix-clay the SEM-EDS (Scanning Electron Microscopy with Energy Dispersive Spectroscopy). The analyses have been carried out on the most standardized glass productions, which are considered "local" manufactures after a morphometric study of the vessels, as well as others that seem to come from other pottery centres, in order to understand the characteristics, dissemination and technology of these potteries.

04 CROSS-CRAFT INTERACTION BETWEEN GLASS AND GLAZE TECHNOLOGIES IN THE MEDIEVAL IBERIAN PENINSULA

Author(s): Duckworth, Chloe (Newcastle University) - Govantes Edwards, David (Universidade Nova de Lisboa)

Presentation Format: Oral

Now playing a prominent role in our understanding of medieval technology transfer, and its social context, the chemistry of medieval glazed ceramics in the Iberian Peninsula has been studied with great success for several years. Far less attention, however, has been paid to their vitreous cousin: glass. Yet glass and ceramic glazes are closely related materials, made with many of the same raw ingredients and colourants, and involving a shared pyro-technological expertise.

Our research combines archaeological, historical, and chemical evidence, to examine the social and technological context of glass production and consumption in medieval Iberia. We are currently conducting an ongoing, large-scale programme of chemical analysis of glass remains including production waste, beads and bangles, and vessel fragments, along with a smaller number of glazed ceramics. Most of the sampled remains come from southern Spain, and were collected as part of the 'al-Andalus Glass Project'. Using preliminary findings from analysis of over 200 of these samples by EPMA-WDS and LA-ICP-MS, we will examine questions related to technological trajectories, cross-craft interaction, and technology transfer. In particular, at what point was primary glass production (re-)introduced to the Iberian Peninsula, and was it stimulated by, or in some way related to, glaze technology?

05 COMPARING GLAZES TECHNIQUES: THE CASE OF BARCELONA AND SEVILLA

Author(s): Madrid i Fernández, Marisol - Fernández de Marcos García, Cristina - Buxeda i Garrigós, Jaume - Peix Visiedo, Judith (University of Barcelona; Cultura Material i Arqueometria UB - ARQUB, GRACPE)

Presentation Format: Oral

The trend of glazing is an innovation on pottery production technology that became common in western Europe from the late twelfth century onwards. But the process of "glazing" entails different degrees of complexity according to the intended final object, that might involve a great variety of raw materials. Accordingly, simple glazing process consists of a single layer applied over the surface of the body, becoming a shiny and transparent coat after firing. The addition of pigments would result in coloured but still transparent ending glaze. More complicate production sequence occurs in glazed pottery with decorative motifs, where opacifiers, pigments and metals are added to the glaze, in order to produce an opaque white glaze to enhance the decoration. This glaze is applied to the bisque pottery and manufactured during a second or third firing. More examples of the diversity of glaze pottery are those when a slip is added between the body and the glaze, avoiding the use of the typical tin oxide as opacifier.

With the aim to deepen knowledge of glazing technique, glazes from coarse pottery, cooking pottery, polychrome coarse pottery and majolica from Barcelona (13th-18th centuries) and Seville (15th-18th centuries) have been studied. The application of the glaze, the thickness, and the composition of glazes (raw materials, opacifiers, pigments and/or metals) have been examined in greater detail by means of Scanning Electronic Microscopy (SEM). Through this study, we intend to observe whether the complexity revealed for the pottery production for both centres, is also correlated with a great diversity on glazes technique. Besides, similarities and differences in the technological process on coarse and cooking ware compared with majolica for both centres, might suggest a unique tradition widespread over the Iberian Peninsula or, perhaps, we are facing different ways, or recipes, to obtain a similar result.

06 ISLAMIC GLAZED WARES FROM ANCIENT TERMEZ (SOUTHERN UZBEKISTAN). RAW MATERIALS AND TECHNIQUES COMPARED WITH MEDITERRANEAN CONTEMPORARY PRODUCTIONS

Author(s): Molera, Judit (Universitat de Vic) - Martínez Farreras, Veronica - Fusaro, Agnese - Gurt Esparraguera, Josep M. (Universitat de Barcelona) - Pradell, Trinitat (Universitat Politècnica de Catalunya)

Presentation Format: Oral

Ancient Termez, located on the southern border of Transoxiana/Mawarannahr, was an important pottery production centre during the Islamic period. Recent archaeological and archaeometric research carried out by the Spanish-Uzbek archaeological team evidenced the manufacture of glazed and unglazed vessels at the workshops found in the lower city (shahristan) and its suburbs (rabad). Glazed local products, mainly dated between the 9th and 16th/17th centuries, include slip-painted, underglaze and inglaze painted wares, splashed sgraffiato, and monochrome wares. The present study focuses on the chemical, mineralogical and petrographic examination of different types of glazed surfaces in order to identify the composition of the materials, glaze recipes, the technological processes involved in their manufacture, and their evolution over the centuries. Thin polished sections were prepared and slips and glazes were analysed by optical microscopy (OM) and scanning electron microscopy (SEM). Crystalline phases inside glazes (crystals and raw particles associated with pigments) were identified by micro-XRD. The composition of glazes, slips and pigments will be compared with Islamic contemporary productions made at Iberian Peninsula as well as a detailed study about opacifying technique. Besides the local glazed products, the study also investigates lustre painted vessels and opaque white glazed items imported at Termez from distant western lands.

07 GLAZED PRODUCTION TECHNOLOGY IN GOLDEN HORDE (1266 - 1341). QUESTIONS OF GENESIS.

Author(s): Bocharov, Sergei (Alfred Khalikov Institute of Archaeology Academy of Sciences Tatarstan Republic; Kazan Federal University, Laboratory)

Presentation Format: Oral

At the edge of the 13th - 14th centuries the ceramic complex obtained in the archaeological research on the sites of South-Eastern Europe this significant changing, and innovations largely related to the origin of mass local production of glazed pottery. So in the 8th - first half of the 13th centuries on cities and settlements of the Northern Black Sea Region used only imported glazed pottery. The main part of glazed pottery in this region introduced from the central and peripheral parts of the Byzantine Empire, a small part of dishes imported from the territories of Iran and Syria. This situation radically changed with the origin of the Mongolian Empire from the middle of the 13th century. In the Golden Horde cities of Sudak and Solkhat and in Genoese Caffa, begins mass production of glazed pottery, the finds of which in the 14th - 15th centuries will be represented in a significant part of the territory of Eastern Europe. Glazed pottery may be used as an additional chronoinicator for the dating of cultural layers. Productions of the cities of the South-Eastern Crimea are recognizable even by little and small fragments. One of the tasks of our study was the research of this group of ceramics by the methods of emission optical spectroscopy and X-ray fluorescence analysis on the big comparative background. More than 600 samples of ceramics became the basis of the study, among which, the main series of vessels made in cities of the South-Eastern Crimea (more than 200 pieces), other samples of glazed pottery made in the Golden Horde cities of the Volga region, Volga Bulgaria, the North Caucasus, in various points of the Northern Black Sea Region and the Near and Middle East (Turkey, Syria, Armenia, Azerbaijan, Iran, Uzbekistan).

08 THE EARLIEST GLAZED CERAMICS IN CONSTANTINOPLE: A REGIONAL OR INTERNATIONAL PHENOMENON?

Author(s): Armstrong, Pamela (University of Oxford; Campion Hall)

Presentation Format: Oral

The starting point of my paper is Hayes' publication of the earliest securely-dated lead-glazed wares in the Byzantine sphere, from the excavations of the church of St. Polyeuktos in Constantinople. These seventh-century wares are compared with the earliest known glazed wares in the Islamic world, namely from the royal complex at Samarra. It is proposed that the technique of glazing in the Christian era was transmitted from Egypt via Syria to Bithynia through a network of monasteries. From Bithynia it was transmitted to Constantinople. It will be suggested that, with supporting evidence, the glazing technique then went from Constantinople to the Islamic world and Samarra in particular. In the Islamic world experiments with the glaze composition produced tin-opacified lead glazes which became the hallmark of Islamic ceramics. One of the most notable is the famous cordon of tiles that adorn the Great Mosque in Cordoba which is included in the progression of glaze techniques in the east and west Mediterranean. This is followed by a consideration of evidence to date, both archaeological and archaeometric about the earliest lead-glazed wares in Italy and southern Europe. The paper ends with a consideration of the adoption in southern Italy of tin-opacified glazes in the medieval period contemporary with the plain lead glazes of northern Italy.

09 FIRING GLAZED WARES IN BYZANTINE KILNS: CONTINUITIES AND CHANGES IN THE TECHNOLOGY OF GLAZED POTTERY PRODUCTION (11TH-15TH C.)

Author(s): Raptis, Konstantinos (Ephorate of Antiquities of Thessaloniki)

Presentation Format: Oral

This paper examines the continuities and changes in the technology applied in the byzantine glazed pottery production during the second firing that was necessary in order the lead-based glaze to be stabilized on the surface of the pre-fired wares.

Based on findings in Middle-Byzantine context, the glazed wares from the eleventh until the late twelfth century were produced in small quantities as luxurious products, meant to be consumed by the byzantine aristocracy. During this period, the second firing of the glazed wares was accomplished in kilns with clay rods, which seem to have been introduced in the byzantine world from the Islamic technological tradition. These were one-storey, updraft furnaces with unified combustion and firing chamber, where-in the glazed wares were put on successive series of shelves, made with clay rods that were projecting over the hearth. In this kiln type the byzantine glazed wares were placed upright on the clay-rod shelves, or sometimes were hanging from sigmoid hangers that were applied on the rods.

From the early decades of the thirteenth century onwards, as the Late-Byzantine glazed table-wares became a mass-trend, several changes were made in their production in order their quantity to be maximized. Thus, even though the lead-based glaze remained chemically unalterable, the kilns with rods—that continued to form the main kiln type of the workshops operating in Western Europe—became a rarity in the Byzantine territory, since the Late byzantine potters used to accomplish the second firing of the glazed wares in regular, two-storey updraft kilns, wherein the glazed wares were stacked upside down inside separated between each other by hand-made, mould-made, or wheel-made tripod stilts, which, even though they were leaving a triple mark on the inner surface of the glazed bowls or plates, prevented the adherence of the production.

10 THE PRODUCTION OF GLAZED CERAMICS IN THE MIDDLE BYZANTINE PERIOD: A VIEW FROM KYTHERA

Author(s): Kiriati, Evangelia (British School at Athens) - Georgakopoulou, Myrto (University College London-Qatar) - Vroom, Joanita (University of Leiden)

Presentation Format: Oral

This paper focuses on the study of a small assemblage of Middle Byzantine pottery (12th c. AD) recovered on the island of Kythera, Greece. It concerned material from a refuse pit, most probably associated with a single episode of discard and included both glazed and unglazed ceramics.

A combination of petrographic and elemental (through WD-XRF) analyses was undertaken for the bodies, to address issues of provenance and technology while scanning electron microscopy was used to investigate the composition and technology of application of the slips and glazes, as well as the firing temperatures of the ceramic bodies. The petrographic and chemical analyses of the bodies clearly show that all had a remarkably similar composition, suggesting a common place of production, which was not compatible with an origin in Kythera and indeed compares very closely with the published profile of the 'Middle Byzantine Production'. Based on recent evidence by research in central Greece, a more precise definition of provenance can be now achieved. Interestingly, the standardisation seen in the body composition is not reflected in the composition of the glazes. All are high lead glazes, but the lead content is variable, as is the evidence for application techniques. Interesting variations are also noted in the white slip compositions, with at least two different types recognised. The colourants are typical of this period, including copper-based green, and manganese or iron-based brown. Such new evidence enhances our understanding of pottery production and trade in the Middle Byzantine period but also of the technology of Byzantine glazes.

As the above evidence on production and technology comes from a consumption context on Kythera at the fringes of the Byzantine Empire, the current study provides also a significant insight into aspects of consumption and trade.

11 THE MEDIEVAL AEGEAN BETWEEN EAST AND WEST : ASSESSING GLAZING TECHNOLOGIES AT GREEK POTTERY WORKSHOPS UNDER BYZANTINE AND LATIN RULES

Author(s): Liard, Florence (IRAMAT-CRP2A, Université Bordeaux Montaigne; Fitch Laboratory, British School at Athens) - Ben Amara, Ayed - Chapoulie, Rémy (IRAMAT-CRP2A, Université Bordeaux Montaigne) - Della Ventura, Giancarlo - Sodo, Armida (Università Roma Tre, Dipartimento Scienze) - Kiriati, Evangelia - Muller, Noemi (Fitch Laboratory, British School at Athens)

Presentation Format: Oral

In the aftermath of the Fourth Crusade (1204), the Byzantine Empire in Greece transformed to a mosaic of feudal territories, with influxes of Frank and Italian settlers interrupted by the presence of the Catalan itinerant army in the early 14th century. Commercial networks, which had been connecting various peoples across the eastern Mediterranean, were reconfigured in the hands of Venice and Genoa. New markets, including Greeks and Latins, developed in former Byzantine cities of Greece, thereby shaping new aesthetics and demands.

Since at least the 9th century, lead-rich glaze-decorated tableware assemblages had been reflecting some changing patterns of commerce and artistic connections over the Mediterranean. In the 12th century, the Aegean region obtained a strategic position within these exchange networks, with the development of several trade and production centers of these wares. Nonetheless, tech-

nological aspects of glaze production in Greece remain largely unknown.

This paper aims at shedding new light on this topic, through a multidisciplinary approach addressing glaze preparation, application, colouring and firing methods using SEM/EDS, Raman Spectroscopy, and optical microscopy. Methodological aspects of glaze analysis are also considered, particularly the variations in glaze composition induced by the interaction between lead glaze and body or slip, patterns of pigment dispersion, and slip composition.

The analysis applies to 14th-century Sgraffito wares with a yellow glaze whose provenance has been ascribed to the areas of Thessaloniki (Byzantine Thrace – 4 samples), Thebes (Frankish/Catalan Boeotia – 4 samples) and Corinth, then under Florentine control (Peloponnese – 5 samples). Samples from western Anatolian and northern Italian workshops (Liguria, Veneto) provide references to glazing and colouring techniques adopted in Latin and Byzantine homelands. The goal is to assess how political conditions and ethnic diversity over the 14th-century Greece may have influenced local developments in glazing techniques, possibly through learning between potters and craftsmen mobility.

12 THE ORIGIN AND DEVELOPMENT OF LOCAL GLAZE TECHNOLOGY IN MEDIEVAL CYPRUS

Author(s): Ting, Carmen - Vionis, Athanasios - Kassianidou, Vasiliki (University of Cyprus)

Presentation Format: Oral

It has been argued that the production of glazed tablewares did not take place in Cyprus until the 13th century AD, which was not only significantly later than other production centres in the Mediterranean, but also coincided with the time when the vying of domination over the island among the Latin political powers and later with the Ottomans intensified. Against this background, one may question to what extent the initial introduction of glaze technology to Cyprus and its development in the centuries that followed was related to the drastic and frequent changes to the socio-political orders? Thus, this study seeks to investigate the glaze technology - with specific emphasis on the composition of the glaze and associated ceramic body, the type of colourant used, the sources of raw materials, and the method of glaze application - of various assemblages of glazed wares produced in Cyprus between the 13th and 16th centuries AD. Analytical methods including scanning electron microscopy energy dispersive spectrometry (SEM-EDS), thin-section petrography, and X-ray diffraction (XRD) are used to characterise the variation in the technology that was used to glaze the tablewares. The data generated are compared with the published ones to explore the degree of similarity between the Cypriot glaze technology and the contemporaneous examples. The observed patterns are further interpreted with reference to the historical contexts to determine whether or not the changes in local glaze technology corresponded with the changes in socio-political orders, as well as to highlight the possible means through which technological knowledge and practices were transmitted.

13 CHARACTERIZATION OF MEDIEVAL GLAZED CERAMICS OF THE EAST PLAIN CILICIA SURVEY

Author(s): Tülek, Füsün (Kocaeli University Faculty of Arts and Sciences) - Aktaş, Gülşah - Atapek, Hakan - Polat, Şeyda (Kocaeli University, Faculty of Engineering, Department of Metallurgical and Materials Engineering)

Presentation Format: Oral

Macroscopic analyses enable to distinguish Zeuxippus ware and Port Saint Symeon ware among the bulk of medieval glazed ceramic shards collected during the archaeological survey in East Plain Cilicia. Both of the well-known medieval glazed ceramics have a wide distribution in all over the Mediterranean basin. Numerous workshops in Constantinople, Aegean and Mediterranean coasts produced Zeuxippus ware or Zeuxippus Family so as the shards of Port Saint Symeon. Initial goals of the analyses are to detect discrepancies in glaze components and application techniques of the ceramic shards so as to find out the distinctive features. For this purpose further examinations of the glazed shards have been carried out by Light Microscope (LM), Scanning Electron Microscope (SEM), Energy Dispersive Spectrometer (EDS) and X-Ray Diffractometer (XRD) in order to identify the microstructural and analytical characteristics of three basic components i.e. substrate (ceramic), filler and glaze materials in shards. For the experimental studies, the samples were taken to reveal the properties of three basic components. Cross sections of the samples were prepared by metallographic methods namely, grinding and polishing. The cross sections were examined by LM and quantitative analyses were carried out. SEM studies were done by using material contrast to reveal different oxide forms and EDS was used to determine the elemental compositions of these oxides. In addition to the microanalysis, XRD studies were also carried out to identify the oxide phases. Results were compared to understand the similarities and differences between Zeuxippus and Port Saint Symeon wares.

14 MILETUS WARE: AN EARLY OTTOMAN MARKER OF A CERAMIC TECHNOLOGY TRANSITION IN WESTERN ANATOLIA

Author(s): Burlot, Jacques (Koç University - Research Center for Anatolian Civilizations - Istanbul; ArAr UMR 5138 - Laboratory of Archaeology et Archaeometry - Lyon) - Waksman, Yona (CNRS - The French National Center for Scientific Research; ArAr UMR 5138 - Laboratory of Archaeology et Archaeometry - Lyon) - Teslenko, Iryna (National Ukrainian Academy of Science - Institute of Archeology - Department of Archeology of Crimea and North-Western Black Sea Region - Kyiv) - Bellot-Gurlet, Ludovic (Sorbonne Universités - UPMC Université Pierre et Marie Curie-Paris 6; MONARIS UMR 8233 - Paris)

Presentation Format: Oral

Previous studies demonstrated a clear difference between Byzantine and Ottoman glazes produced in western Anatolia; the first being of transparent high-lead type, and the second, at its summit in the 16th century, of lead-alkali type with a slight tin opacifi-

cation. Our recent study on the so-called Miletus Ware, suggests that this early Ottoman pottery might be the key to understand this technological transition. Indeed, the Miletus Ware is considered one of the first produced by Ottoman potters and features typological and stylistic characteristics which coincide with the introduction of new recipes and the use of new materials, which will be further developed in later Ottoman times.

Our study was conducted on archaeological samples of Miletus Ware from eight sites in Turkey and Crimea, whose productions were defined and contextualized through archaeological research and provenance studies carried out by elemental analyses by WD-XRF of the ceramic bodies. The results that will be presented focus on the decoration techniques defined by analyses of glazes and underglaze paintings using SEM-EDS and Raman spectroscopy.

These results show that there were two main innovations in the Miletus Ware glaze production technology. First, its glaze recipe included new sodium-based fluxes. Second, some underglaze decorations like the black and dark blue ones – obtained respectively with pigments featuring magnesiochromite and cobalt – were produced with materials that potters in western Anatolia did not use before. These observations demonstrate that Miletus Ware was a marker of a technological transition in late medieval western Anatolia, whose production implied the use of new resources, as well as the creation of new commercial relationships in the ceramic industry of this region, likely favoured by the expansion of the Ottoman empire.

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HUMAN, POSTHUMAN, TRANSHUMAN DIGITAL ARCHAEOLOGIES

Theme: Theories and methods in archaeological sciences

Organisers: Diaz-Guardamino Uribe, Marta (Cardiff University) - Morgan, Colleen (University of York) - Frieman, Catherine (Australian National University)

Format: Session with precirculated papers

Our engagement with the digital is reformulating the ways in which we (post/humans) engage with/create our worlds. In archaeology, digital processes and media are affording new practices of production, consumption and reception of knowledge, while throwing new light on existing analog methods. The digital is extending our cognitive and sensual capabilities, allowing us to explore previously uncharted grounds, giving us tools to envision the past in different ways, and enabling large datasets to be processed, distributed, and engaged with interactively. During this process, critical appraisal of the archaeological-digital has been relatively limited. In this session we will evaluate the growing paradigm of digital archaeology from an ontological point of view, showcase the ways digital technologies are being applied in archaeological practice—in the field/lab/studio/classroom—in order to critically engage with the range of questions about past people and worlds into which digital media give us new insights and avenues of approach. We ask how digital media and technology are being applied, whether they are broadening access to the archaeological record and how they are shifting relationships between archaeologists, the archaeological record and the public. Papers should have a theory-based approach to digital archaeological methods and set the agenda for future investigation. They should discuss the ways digital archaeology is affecting, disrupting and/or enhancing archaeological fieldwork, public archaeology, education and the publication/dissemination of archaeological data. Of particular interest are papers that engage with creativity and making, digital post/transhumanism, query analog methods through digital media, and feminist, indigenous or queer digital archaeologies.

ABSTRACTS

01

INTRODUCTION TO SESSION: HUMAN, POSTHUMAN, TRANSHUMAN DIGITAL ARCHAEOLOGIES

Author(s): Diaz-Guardamino Uribe, Marta (Cardiff University) - Morgan, Colleen (University of York) - Frieman, Catherine (Australian National University)

Presentation Format: Oral

This presentation will introduce the session, outlining its aims and setting the papers into context. The session aims to evaluate the growing paradigm of digital archaeology and set the agenda for future investigation. Contributors to this session showcase the ways digital technologies are being applied in archaeological practice, and critically engage with the range of questions about past people and worlds into which digital media give us new insights and avenues of approach.

Papers introduce ways to creatively explore the ambiguity of archaeological data to communicate dynamic human-scale pasts, and to enmesh archaeology, sensoriality, collaboration, and analog creative practices. The capacities of digital technologies to enchant the public, to enhance explorations of people, things and place, and to mediate and transform the experience of fieldwork, will also be discussed. The potentials for a posthuman and postdigital archaeology will be considered, demonstrating how critical engagement with analog and digital tools can productively disrupt and interfere with our understandings of past people and ourselves. Papers will scrutinize how digital technologies can contribute to disrupt the hierarchies of knowledge production and expertise, contribute to socialize knowledge about the past, to activism and advocacy by disrupting traditional narratives of the past and contemporary sociopolitical structures. Issues of immateriality in the past and in the digital present will be discussed within a posthumanist framework, while the ontology of digital models and the possibilities of digital remnants for socio-technical networking will be explored from the perspective of an artist working alongside archaeologists.

02 DIGITAL PATHS TO REVEAL HOW ARCHAEOLOGISTS IMAGINE/CONSTRUCT THE PAST

Author(s): Tringham, Ruth (Dept. of Anthropology, Univ. of California)

Presentation Format: Oral

My engagement with the digital has always emerged and developed as a result of challenges within analog formats of practice. My own revelations with the creative possibilities enabled by the feminist practice of archaeology led me to the challenge of enhancing interpretations of empirical data with imagined accounts of the daily lives of prehistoric actors (albeit mostly female). The challenge of creating a legitimacy for these accounts by demonstrating their linkages to the data from which they were drawn, while simultaneously retaining their playful and creative nature, drove me to immerse myself in the possibilities of digital formats such as hypermedia (in 1993). And so began my exploration of digital technologies that make transparent how we, as archaeologists, construct a past from our empirical data and from our imaginations that is full of dynamic human beings going about their daily and sometimes extraordinary tasks, moving constantly, conversing, thinking, dreaming, having lives and personalities. However, the timings of what I imagined could be done with digital resources did not always coincide with what could be done, either because the technology was not yet accessible to a consumer, or because I did not have the technological skills to make it happen, or, as was more frequent, both. This presentation, using some surprise multimodal “tricks”, will share some of this path of exploration. I have come to the conclusion that there are still many ways in which the ambiguity of archaeological data could be celebrated and explored creatively with digital formats to express a dynamic human-scale past that the creators of primary archaeological data - the content of things digital - have not yet been willing to take the risk or make the time to try.

03 DO ARCHAEOLOGISTS DREAM OF ELECTRIC SHEEP?

Author(s): Danis, Annie (University of California, Berkeley)

Presentation Format: Oral

Post-colonial, queer, activist and sensory archaeologies demand new tools. If the definition of insanity is repeating the same actions and expecting different results, many archaeologists have recognized the insanity of business as usual and reached into digital or “new” media. In this paper I address how the affordances of particular media technologies (like paperless recording, film, and video) create the conditions of possibility for collaboration in sensorial archaeologies. The virtuality of digital media should not overshadow how archaeologists, collaborators, stakeholders and the public actually encounter archaeology — IN REAL LIFE. Many collaborators, especially youth, conceive of their worlds not as full of new media but as, “always already new” (Gitelman 2006). The dreams made possible by digital media can realize the goals of new archaeologies when we acknowledge the contexts in which they circulate.

This paper draws on archaeological work in engaged archaeology using both analog and digital media to integrate digital archaeology into a framework of creative practice that balances analog and digital, actual and virtual, to highlight the augmented and mediated nature of archaeological work and narratives. Using some multimodal tricks, I present one path of exploration to enmesh archaeology, sensoriality, collaboration, and analog creative practices. I have come to the conclusion that key to the goals of engaged and sensuous research is a practice that highlights and represents the process of knowledge production and the inherent ambiguities of creating narratives about the past.

04 PUNK ARCHAEOLOGY, SLOW ARCHAEOLOGY, AND THE ARCHAEOLOGY OF CARE

Author(s): Caraher, William (University of North Dakota)

Presentation Format: Oral

Recent research has emphasized the significant impact that digital technology is having on archaeological practice. Over the last decade, my work has tried to come to terms with post and transhuman archaeology. First, I proposed a “punk archaeology,” which looked to rawness and immediacy of punk rock music as a model for a disruptive interest in the performance of archaeological work. Later, I became intrigued by the popular “slow foods” movement as well as in the work of diverse scholars on the rapidly accelerating pace of modernity as a model for a “slow archaeology” that sought to trace both the rhetoric surrounding and practice of digital technology in field practice. Recent work by Eric Kansa and Ömür Harmanşah have pushed me to recognize that slow archaeology may well offer a solid foundation for critiquing the growing influence of neoliberal expectations in the use of digital tools in archaeological work.

This paper draws on field experiences doing intensive pedestrian survey in the Mediterranean and the archaeology of the contemporary world in North Dakota to consider how digital tools mediate and transform not only archaeological information in the field, but also the experience of fieldwork. Critical reflections on these processes have shaped an archaeology of care that considers more than the efficiency, accuracy, and convenience of digital tools and analysis, and, instead, shifts the focus how the archaeologist and these tools creates a meaningful space of archaeological practice. Archaeology of care foregrounds the constitution of the archaeological field team, interaction between archaeologists and communities during field work, the location of archaeological analysis, and the experience of archaeological knowledge making to expand our sensitivity to the ways that digital technology is transforming our discipline.

05 THE ENCHANTMENT OF THE ARCHAEOLOGICAL RECORD

Author(s): Perry, Sara (Department of Archaeology, University of York,)

Presentation Format: Oral

A growing body of research testifies to the capacity for archaeological and other cultural heritage sites to generate wonder, attachment, personal transformation and restoration, family bonding and community building amongst their visitors. One might argue, following political theorist Jane Bennett, that these sites have the power to enchant – and, in so doing, they stand as seedbeds for human generosity, ethical mindfulness, and care for the world at large. However, the means by which such enchantment is bred, and the extent to which these intimate, emotive, social and sensual encounters with the pre/historic record can be deliberately crafted by archaeologists and heritage practitioners, are little understood.

Digital technologies themselves are regularly touted as tools to beget empathy, connectivity, novel interactions and human consciousness. They, too, are increasingly deployed in the context of creating memorable touristic experiences at heritage sites. Yet our empirical understanding of their relationship to enchantment—their impact on nurturing visitors both as potential stewards of the archaeological record and as good citizens in general—is still nascent. Using evaluation data from two related European Commission-funded projects, CHESS (www.chessexperience.eu) and EMOTIVE (www.emotiveproject.eu), we discuss here our work in developing emotionally-engaging digital stories for visitors to diverse cultural heritage sites. Our findings testify that such stories can easily provoke profound self-reflection, personal attachment and compassion in the moment, which leads us to consider how their enchanting capacities might be pushed even further into the building of broader, collective social conscience and long-lasting goodwill.

06 “THE SLOW REGARD OF SILENT THINGS...” WORKING THROUGH DIGITAL/EXPERIMENTAL ARCHAEOLOGIES/DEEP MAPPING

Author(s): Gearey, Benjamin (Prehistoric Society/UCC Department of Archaeology) - Power, Orla-Peach (Digital Humanities, University College Cork)

Presentation Format: Oral

In this paper we consider the interface between digital, experimental archaeologies and deep mapping. We will outline the work of The Pallasboy Project, which was conceived as an experimental archaeology project but morphed during its extended and on-going duration into what we argue is a hybrid, drawing on elements of archaeological and artistic practice, craft and creativity, with digital technologies a key component linking across these themes. The paper will reflect on the various articulations between method, practice and outputs in this work, drawing on theoretical frameworks that stress process, connectivity, ‘flattening’ of knowledge systems and the democratizing of knowledge (e.g. Springett 2015). We will critically consider the role of digital technologies within this hybrid-framework, focusing on 3D modelling and considering how such models and associated ‘digital narratives’ can link between archaeological and virtual artefacts and can be used to engage and communicate with diverse audiences, although this is not without its own issues. We propose that further dialogue between theory and method in deep mapping, drawing as it does on digital technologies and experimental archaeology could lead to enhanced explorations of people, things and place.

Reference:

Springett, 2015. Going flatter or deeper? Connecting Deep Mapping, Flat Ontologies and the Democratizing of Knowledge. *Humanities* 4, 623-626.

07 AVATARS, MONSTERS, CYBORGS & MACHINES: A POSTHUMAN DIGITAL ARCHAEOLOGY

Author(s): Morgan, Colleen (University of York)

Presentation Format: Oral

The digital has become pervasive, tedious, and worryingly invisible in archaeological work, embedded in the craft of archaeological knowledge production. While (Morgan and Eve, 2012) have previously stated, “we are all digital archaeologists” it is perhaps more accurate to propose that we are all cyborg archaeologists, intermingling and overlying senses afforded by digital media; intervening in a posthumanist past. Whereas many seek to seamlessly embed digital technologies into everyday archaeological methodologies, I call for an alternative practice that dives into the uncanny valley, highlights chronological disruptions, that queers and interferes with our understanding of ourselves and the past. A cyborg archaeology acknowledges that our bodies are dividual, “weedy and promiscuous” (Haraway 1991; 1995) and the boundaries between machines and humans, nature and culture and the present and past are inevitably permeable. Through exploring avatars, monsters, cyborgs, and machines, I discuss the potentials for a posthuman and postdigital archaeology, wherein critical engagement with all of our tools, analog and digital, can productively obscure and deny as much as they enhance and reveal. In this talk I present my current research in troubling the embodied encounter with the past, wherein the digital de-naturalizes and disturbs our assumptions about shared experiences with past people while simultaneously transgressing our bounded construction of our current selves.

08 CLOSE TO THE BONE: DIGITAL DISRUPTION AND PRACTICE BASED LEARNING IN THE ANU SKULLBOOK PROJECT

Author(s): Frieman, Catherine - Grant, Katrina - Nurmikko-Fuller, Terhi - Samper Carro, Sofia (Australian National University)

Presentation Format: Oral

By now we have all read about the power of digital technologies and associated practices to disrupt everything from the recording industry to rental properties. Digital disruption has also occurred in our classrooms and universities, with more content being moved online and a premium placed on freely accessible content. While the initial promise of MOOCs and open lectures have not entirely lived up to the hype, we feel that digital technologies and the wider digital culture—which advocates openness, equality and accessibility—can still transform our classrooms and our teaching practice in small and large ways. In this paper, we will present a case study from an ongoing digital humanities-archaeology collaboration in which we are using digital methods and practice based learning to disrupt the hierarchies of knowledge production and expertise found in the typical university classroom.

In 2017, the Skullbook project launched at ANU. The idea was simple: make the ANU's faunal reference collection more accessible by scanning and 3D printing representative skulls, creating both a lending library of 3D printed skulls for ANU students to use in their research as well as a freely available, open access resource. In October 2017, we handed four skulls—a kangaroo, a wombat, a cat and a coyote—to a cohort of Digital Humanities masters students and asked them to develop workflows for scanning skulls to 3D printing standards. Their scanned skulls were colourful, artistic, detailed and problematic in equal measure, but certainly not standardised. As the project develops we seek to continue our student led process of digital discovery. In this presentation, we will discuss the initial results of the Skullbook project, its successes, failures and surprises and meditate on the value of situating expertise and knowledge creation among students rather than behind the lecturer's podium.

09 VOICES IN THE MAKING: QUEER, FEMINIST DISRUPTIONS OF (DIGITAL) ARCHAEOLOGY

Author(s): Cook, Katherine (McMaster University)

Presentation Format: Oral

Coding, maker and hacker cultures revel in the ways in which creating, tinkering and breaking can be used to radicalize participation and change engagement and power. Public archaeology has in turn adopted many of these practices and principles to make room for more voices, for more individuals and communities to make the past. In challenging who gets to do digital archaeology we can also challenge representations of people in the past, and ultimately contemporary perceptions of culture, diversity, and inclusivity. However, in removing barriers, the digital equally throws up new boundaries and limitations. Critical appraisals of digital scholarship and tech-centred industries have increasingly underscored the pervasive structures of privilege, inequity and inaccessibility, both for audiences/users/participants and coders/makers/hackers. This paper will examine the intersections of dissent, public-ness, and risk-taking in archaeological knowledge production and reception. Focussing on the intersections of research, classroom and museum contexts, this paper will consider the relationship between identity, inclusion and making in (re)formulating archaeology as a place to transform the past, present, and future. The ways in which queer and feminist voices are using digital, translational storytelling and creative media to disrupt traditional narratives of the past but also contemporary sociopolitical structures, including in academic/professional circles, has the potential to establish a valuable and dynamic future agenda of activism, advocacy, and impact in archaeological theory.

10 PUSHING THE BOUNDARIES OF EPIGRAPHIC KNOWLEDGE: DIGITAL TECHNOLOGIES FOR RECORDING, ANALYSING AND DISSEMINATING ROMAN INSCRIPTIONS

Author(s): Espinosa-Espinosa, David - Carrero-Pazos, Miguel (University of Santiago de Compostela)

Presentation Format: Oral

The application of digital technologies in Archaeology, especially in epigraphic studies, is ensuring an accurate record, a more reliable analysis and a broader dissemination of research results. In the case of Roman Epigraphy, Digital Image Modelling methods are enabling a higher precision in the recording and analysis processes than traditional techniques, being extremely useful tools in the work of the epigraphist.

This paper aims to present a series of experiences and challenges from "Epigraphica 3.0: Towards the Creation and Design of a Digital Corpus of Latin Inscriptions from the Province of Ourense". The purpose of this project, funded by the Regional Government of Galicia (Spain), is to improve the epigraphic knowledge in two areas: 1) in methodological terms, recording, analysis and dissemination; 2) from a historical point of view, contextualising and characterising this cultural practice. Regarding the first one, we use the latest advances in Photogrammetry SfM, 3D model filtering and non-photorealistic rendering techniques to get a virtual tracing of the inscriptions. On the other hand, we are developing a relational database and a specific website with 3D and cartographic viewers. This website aligns itself with the concept of "Web 3.0": it allows multiple-criteria searches, an intuitive real-time interaction with digital content and the download of the information as 3D PDF files. Concerning the second one, the project outcomes will provide a solid basis for identifying possible epigraphic workshops, defining epigraphic landscapes, and quantifying and considering Romanization processes in a more precise way (local identities, religious beliefs, personal onomastics, iconographic motifs, etc.).

The result is a digital corpus of Roman inscriptions designed to break down epigraphic knowledge barriers, making information available to a wide international user community, allowing a comprehensive approach to people and communities who created the inscrip-

tions, and contributing to socialise the epigraphic heritage from the Roman period.

11 THE ILLUSION OF IMMATERIALITY: TOWARDS A POSTHUMAN VIEW ON MATERIAL ABSENCE AND DIGITAL PRESENCE IN ROMAN ARCHAEOLOGY

Author(s): Mol, Eva (Brown University)

Presentation Format: Oral

In this paper I want to explore different avenues of how archaeologists can contribute to and learn from theorizing the digital world beyond the traditional functionalistic way of applying computational methods. Firstly this concerns challenging transhumanism as a critical acceptance of technological innovations and hybridization of the human-tech being. Even when regarding this a worrying development, the wide-ranging human acceptance and openness to otherness can also be used as a window of opportunity for a better understanding of posthumanism. Analyzing the current ease of embracing the human-digital co-dependencies can create a platform of consideration for posthuman categories in the past and the vibrancy of what is seemingly deemed the 'immaterial'.

In discussing issues of immateriality in the digital present and in the past, I want to use phenomenology of the absent, or dark phenomenology, to help take a more holistic approach to these issues. Dark phenomenology relates to that which we cannot access in human experience, yet affect and shape us, and trying to get access is important to understanding of how we built perceptions of the world. Digital technology could be a very constructive tool in this, for its ability to open up possibilities of non-human experience. I want to explore these 'dark sides' through the example of an absent temple in Rome that is made accessible to us through a variety of representations and reconstructions, and show how experimenting with this might change our approach to object/human/divine relations in Roman cults and how we present Roman heritage towards a posthumanism framework. Not because this is considered a more realistic ontology, but because it can give us more insight in representation, how the past is understood and re-interpreted, and how the consequences affected our understanding of the Roman past and its remains.

12 ECOLOGIES OF THE DIGITAL SYNANTHROPE: SELKIE WIVES AND BUFFALO STONES

Author(s): Minkin, Louisa (University of the Arts London)

Presentation Format: Oral

This paper will consider questions raised as an artist working alongside archaeologists on the Making a Mark project. This five year project looked again at the decorated and portable objects of the British Neolithic. The shifting relationships of field walking and narration as practices produced a set of encounters with things and sites, with their digital counterparts and technical images. Encounters and interactions. Data capture produced new objects: things we compiled, fabricated, rigged and assembled. Bundles, pelts, skins and shells. Re-purposed proto-objects, unwrapped UV maps. Such engagements led us to consider the anatomy, pathology and ontology of a digital model. We developed a sense of the ecology of the digital synanthrope, neophyte familiars and pest species nesting in the midden, breeding exponentially in the image-dump, spinning webs in the dark spaces and black boxes. Our method here is that of the fox, digging holes in the section, queering the strata for reasons of our own. We want to talk about the possibilities this project opened out for socio-technical networking: the activation of digital remnants - the taphonomy of expropriated artefacts in UK collections - by Indigenous art programme students in SW Alberta. We hope to hear the song of a buffalo stone.

368 ARCHAEOLOGY OF MOVEMENT

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Kristjansdottir, Steinunn (University of Iceland; National Museum of Iceland) - Walser III, Joe (University of Iceland) - Jakob, Tina (Durham University) - Ahlin Sundman, Elin (University of Iceland)

Format: Regular session

Human migration directly influences the culture of the individuals in movement as well as their receiving society. These influences can be wide and varied, possibly affecting health due to the transfer of pathogens, introduction of new behaviors or materials, and the outcomes of human reciprocal adaptation to new or old environments, fauna and flora. Large and small population movements may occur due to ritual, pilgrimage, religion, slavery, politics, conflict and marriage, amongst other factors. Using techniques such as isotopic, ancient DNA, and osteological analysis, as well as artefacts and written records, in conjunction with other methods in archaeology and anthropology, this session seeks to examine the impacts of migration on health, culture, ideologies and the environment. Although we welcome submissions presenting isotopic and ancient DNA analyses used for tracing migration, this session aims to emphasize submissions using archaeological theory, material culture, textual evidence, linguistics and other non-biomolecular methods to investigate migration. This session is particularly interested in addressing the impacts of the mobility of people to and from close, isolated or distant places, between institutions and across cultures.

01 THE LANGOBARDS IN ITALY: MIGRATION AND HEALTH IN THE VENETO

Author(s): Maxwell, Ashley (University of South Florida)

Presentation Format: Oral

This paper integrates historical and osteological analyses within a migration theory framework to understand how the migration of the Langobards into northeastern Italy affected migrant and indigenous cultures in the area. The Langobards were part of the end of the Great Germanic migrations, entering northern Italy during the late 6th century AD. Their arrival led to multiple conflicts with Byzantine/Roman populations, ultimately dividing the landscape. The Veneto is the second region the Langobards settled after their entry into Italy, which was part of the first wave of migrants. Historical records suggest that with the invasion of the Langobards, the creation of more scattered land operations with ruralized towns occurred, leading populations to rely on localized resources. Millet, often considered a low status food source, increased in production during this period, possibly as a response to this transitional period of intense cultural interaction. Little osteological and archaeological research has been conducted on the Langobard and indigenous populations in the Veneto during their initial arrival into the region. Thus, this paper will provide new data on the health of these populations from excavated Langobard cemeteries from the late 6th to early 7th century AD, and explore their interactions with the Italian landscape.

02 LIFE AND DEATH ON THE WAY OF STARS: OSTEOLOGICAL, ISOTOPES AND ADNA ANALYSES ON THE MEDIEVAL CAMINO DE SANTIAGO

Author(s): Ramallo, Patxi (Department of Archaeology, Max Planck Institute for the Science of Human History; "La Caixa" Banking Foundation) - Rodríguez-Varela, Ricardo - Götherström, Ander (Department of Archaeology and Classical Studies, Stockholm University) - Higham, Tom (Oxford Radiocarbon Accelerator Unit, Research Laboratory for Archaeology & the History of Art, University of Oxford) - Grandal d'Anglade, Aurora (Instituto Universitario de Xeoloxía, Universidade da Coruña - UDC) - Etxeberria, Francisco (University of the Basque Country - UPV/EHU) - Roberts, Patrick (Department of Archaeology, Max Planck Institute for the Science of Human History)

Presentation Format: Oral

Santiago de Compostela is, along with Rome and Jerusalem, one of the most important pilgrimage centres for Christians in world-wide. Every year, more than 300,000 pilgrims and 3 million tourists arrive from different countries to the capital of Galicia, in the northwest of Spain, to see the cathedral where the remains of the apostle Saint James are buried. At the beginning of the 9th century AD, the tomb of St. James was re-discovered, stimulating the emergence of a new, multi-cultural medieval city, the first in Galicia, populated by pilgrims, merchants, peasants or sailors attracted by the new socio-economic opportunities this religious centre had to offer. The popularity of this new city, Santiago de Compostela (Saint James from the Field of Stars), was only to grow through the 11th and 13th centuries AD.

We have applied ancient DNA, stable isotopes, C14 and osteological analyses to human remains uncovered from the Cathedral of Santiago de Compostela, in order to study the changing socioeconomic demographic and dietary context of the Camino de Santiago in the north of Spain during a phase of dramatic growth in medieval pilgrimage. We demonstrate the growing diversity of cultures, and associated dietary practices and demographic mobility, in the urban and funerary network of this city as a result of increased Catholic pilgrimage into the northern Iberian Peninsula in the Medieval period. The multidisciplinary approach presented here offers much potential in the context of reconstructing religious connections and mobility in the past and providing detailed insights into the origins of a pilgrimage that remains central to Catholic Europe today.

03 LEPROSY IN SCANDINAVIA IN THE WAKE OF MIGRATION DURING VIKING AGE

Author(s): Ahlstrom Arcini, Caroline (National Historical Museums)

Presentation Format: Oral

Leprosy, a disease that may disfigure a person beyond recognition, has accompanied humanity for a long time. It could start with the eyelashes coming loose, the skin becoming hard in several places on the face, and large nodules arising. In certain cases, spots of varying size appear on the skin and feeling is lost. The nerves in the peripheral parts of the body are affected, which lead to paralysed muscles. As a consequence, the person could easily incur injuries, wounds, and infections. The skeleton is affected too, as the bones of the hands and feet, and the small piece of bone in the lower part of the nasal bone, regressed. For a person who had lived with the disease for a long time, the hands and feet could look like lumps with nails because the fingers had regressed. Leprosy is an infectious disease that gained a strong foothold in Scandinavia at the end of the Viking Age. The oldest case of leprosy in Scandinavia has been found in a cemetery in Halland and dated to AD 70–570. If this was one single case we do not know since cremation was the dominating way of burial custom. What we know is that it became common in Scandinavia during the Viking Age and Early Middle Ages. The disease quickly gained a foothold in several places. In the earliest days of Lund (A.D. 990-1050) in Skåne we find the largest reported accumulation of leprosy cases buried in ordinary church graveyards. However, we also see cases at the smaller rural cemeteries. Strontium analysis of some of the affected indicates that they were not brought up in the same place as they were buried, which may indicate a spread of the disease through migration.

04 HYPEROSTOSIS FRONTALIS INTERNA AS A MARKER OF SOCIAL STATUS? EVIDENCE FROM THE BRONZE-AGE NORTHERN CAUCASUS PASTORALISTS AND VOLGA-DON SARMATIAN NOMADS

Author(s): Buzhilova, Alexandra - Berezina, Natalia (Moscow State University)

Presentation Format: Oral

Hyperostosis Frontalis Interna (HFI) is an idiopathic condition manifested by bone formation involving the endocranial surface of the frontal bone. The etiology of HFI is uncertain (unknown genetic predisposition, pressing of environmental factors or metabolic diseases). HFI in modern people is associated with post-menopausal women (40-60%) and elderly men (22-35%). Different investigations showed that HFI was usually rare in antiquity because the life span was shorter than today, but in archaeological specimens often the frequency of HFI of male cases is higher than in clinical samples. Thus, the occurrence of HFI in archaeological male groups is not directly related with age. This analysis aims to investigate the impact of lifestyle on the prevalence of HFI, focusing on the roles of sex-age and daily life.

There were studied 647 skulls from different series of Bronze Age pastoralists and agriculturalists from Northern Caucasus, and Sarmatian nomads (4th BC – 2nd AD) from steppe area between Volga and Don. Our results confirmed the previous data that in archaeological series often there is prevalence of HFI in men, not in women. The material, presented different models of economic-cultural types, gave possibility to look for the reasons of occurrence of HFI. In all variants of the models the high prevalence of HFI was associated with populations of agriculturalists and pastoralists versus the nomads. Apparently, this trend can be related with mobility of the groups studied. The least number of HFI is noted among the most mobile groups of nomads. Interesting is the tendency that all the economic-cultural models demonstrate the prevalence of the HFI in young men versus young women. The results are discussed in the fields of biology of HFI and social organization of gender everyday life. Grant RFBR 17-29-04125.

05 MOVING THROUGH TIME: AN ANGLO-SAXON «WORKBOX» IN AN EARLY VIKING AGE BURIAL FROM NORWAY

Author(s): Glorstad, Zanette Tsigaridas (Museum of Cultural History)

Presentation Format: Oral

The many insular objects found in Viking Age burials in Norway, are often seen as manifest evidence of the range of plunder and contact from the shores of Norway towards the British Isles from the late 8th century. Still, once in a while there appear glimpses of other stories, and of more varied patterns of mobility and interconnection within and across the North Sea. This paper explores this issue, by examining a variant of an Anglo-Saxon “workbox”, found in a late 8th/early 9th century female burial in the isolated Setesdal valley in South-Norway. Although recognized as a unique object at its registration in 1920, the box since escaped all attention. The variant is known from 7th c. burials from Bornholm in Denmark, and other variants are known from England and from Frankish and Lombardic cemeteries.

The Setesdal-box represents the only one from Norway, and the northernmost find of these objects. Their function has been disputed, but recent interpretations suggest that they contained amulets or Christian relics. The box from Norway serves as a peek hole into a more nuanced story of mobility, ideological transmission and object transformation across the North Sea, in the period leading up to the Viking Age.

06 CHILDHOOD MOBILITY: STRONTIUM ISOTOPE PERSPECTIVE

Author(s): Hrnčir, Vaclav (Charles University)

Presentation Format: Oral

The application of biogeochemical analyses, especially strontium isotope ($87\text{Sr}/86\text{Sr}$) analysis, has enabled archaeologists to distinguish between individuals of local and non-local origins at archaeological sites. Although most common, this is only a part of the whole story this method can reveal to us. As several researches have already suggested an analysis of two or more teeth per individual can provide an evidence for mobility during an individual's childhood. The aim of this paper is to present the world-wide survey of multiple tooth analyses published so far. As expected, the results show that significant number of individuals have variable strontium ratios between teeth mineralizing in early childhood (e.g. first molar) and those mineralizing in later childhood/adolescence (third molar). This indicates dietary change and thus potential residential change of these individuals during their youth, however, another possible explanations known from ethnographic and historical context, such as herding activities of children or varying land use strategies in the heterogeneous geological environment, should be also considered. Moreover, the compiled data suggest that incorporating multiple tooth analysis into overall paleomobility research can have significant impact on the proportion of identified non-locals. Because there are always research limitations (poor teeth preservation, budget restrictions etc.), the conditions under which makes the most sense to perform multiple tooth analyses will be also discussed.

07 A NEW REGIONAL MIGRATION APPROACH IN ARCHAEOLOGY: RURAL MIGRATION IN NORMANDY (FRANCE) DURING THE ROMAN PERIOD

Author(s): Spiesser, Jérôme (University Paris 1 Panthéon-Sorbonne; UMR 7041 ArScAn, équipe Archéologies Environnementales)

Presentation Format: Oral

France has been experiencing difficulties for many years, in terms of territorial planning. A number of politicians and researchers

wish to curb the desertion of the country side, caused by the enlargement of the Parisian megalopolis. The development of archaeological research in recent years has revealed that some agricultural territories have already been abandoned in the course of history, because of the attractiveness of neighbouring spaces. This is particularly the case of Normandy where the coastal areas, yet densely populated at the end of Protohistory are abandoned from the 3rd century AD. for the benefit of sectors upstream of the Seine Valley. The study of these regional migrations will allow in the near future the identification of the causes in order to understand these phenomena.

This communication will present the displacement of the Norman rural populations during the Antiquity, by analysing the evolution of the densities of rural settlements, starting from the 1181 archaeological operations realised since 1990. In total, these operations cover an area of 69.05 km².

This led to the discovery of 222 Gallic or Roman farms, a density of 33 sites per 10 km². The evolution of this occupation density has been stable since 2003. The resulting occupation patterns are therefore reliable. At the end of Protohistory, coastal cities of the Oceanus Britannicus (Channel) are more densely populated than the rest of the territory with an average of 16 settlements every 10 km² against 11 rural settlements every 10 km² for inner cities. This trend reversed during late Antiquity, when there was a higher density of settlements compared to the coastal cities that deliver only three settlements every 10 km². There is thus a displacement of the Norman rural populations in the 3rd century AD with the abandonments of coastal spaces whose cause still remains enigmatic.

08 EXTERNAL AUDITORY CANAL STENOSIS IN NEOLITHIC GROUPS (ASPECTS OF EVERYDAY LIFE)

Author(s): Berezina, Natalia - Buzhilova, Alexandra (Moscow State University)

Presentation Format: Oral

In the study of material from cranial MSU collection, dated from Mesolithic to Neolithic period, emphasis was placed on identifying middle ear disease (external auditory channel stenosis - EACS), associated with various causes (infection of specific and non-specific nature, traumas and probably the effects of diving in cold water). The pathology is acquired with age and is fixed in the adult population. The topic is relevant for the reconstruction of the life of hunter-gatherer societies, as individuals with the pathology have a decrease in hearing, tinnitus is observed, and often severe headaches occur, which makes such a person not successful in hunting.

A high frequency of occurrence of this trait in several cemeteries was noted. Traces of EACS were noted in one case (6.7%) in the Voloshsky site, dating from the Mesolithic epoch; in 18.2% in the Vovnigi I cemetery and 43.5% in the Vovnigi II site. The last two sites are located opposite each other on both sides of the Dnieper and belong to the circle of the Dnepro-Donets community. The sites are dated by the finale of the early stage (Vovnigi II) and the beginning of the late stage (Vovnigi I) of the Dnepro-Donets culture, in absolute dates of about 5500 BC. (Telegin, Potekhina 1987). A gender-based assessment showed that EACS dominates in the male part of the investigated population.

A comparative analysis with other Mesolithic and Neolithic series showed that the highest incidence of ear pathologies is observed in the north of Europe, in groups that are located near large water bodies. Our data is matched with results known for the Mesolithic groups of Central Europe. The frequency of the pathology in synchronous series from southwestern Europe is lower than we fixed for Vovnigi groups.

09 MOVING BETWEEN WAR AND PEACE IN THE 1521 BATTLE OF VÄSTERÅS

Author(s): Ahlin Sundman, Elin (University of Iceland)

Presentation Format: Oral

Medieval warfare often involved long distance movement of people, between different provinces and countries. During battle, however, the small scale movements of the troops in the battlefields were more palpable. In the battle of Västerås, April 29, 1521, which was part of Gustav Vasa's rebellion against the Kalmar Union, the rebel troops defeated the unionist forces. Here, the movements during battle will be discussed, particularly the movement between the world of war in town, and the world of peace in the priory. The unionists alternately ran for cover in the Dominican priory, alternately stormed out in new attacks. This could also be understood as a movement between different states of mind, between arrogance – displayed before battle – and humility in face of defeat.

Already during the excavations of the priory in the 1950s, the many skeletons with battle related injuries were noted, including two men with early 16th century crossbow arrows in their chests. The osteological analysis showed that several skeletons with unhealed blade injuries also had older, healed injuries, indicating previous experience of battle. This has been interpreted as men fallen in the battle of Västerås. By giving refuge to the defeated and burying the dead, the Dominican friars got involved in the conflict.

10 DIET, MOBILITY AND DISEASE AT SKRIÐUKLAUSTUR MONASTARY (1494-1554 AD)

Author(s): Walser III, Joe - Kristjánsdóttir, Steinunn (University of Iceland; National Museum of Iceland) - Jakob, Tina (Durham University)

Presentation Format: Oral

A suite of elemental, palaeopathological and stable isotope analyses aimed at reconstructing diet and geographic residence and identifying exposure to toxic earth elements have been conducted on skeletal remains excavated from Skriðuklaustur hospital and monastery (1494-1554 AD) in eastern Iceland. Skeletal remains from an inland farm site called Skeljastaðir (pre-1104 AD) in southern Iceland were also analysed for comparison. The Skriðuklaustur skeletal assemblage contains the majority of Iceland's examples of infectious disease and is the only site in Iceland where acquired syphilis has been diagnosed from skeletal remains.

The monastery operated also as a sophisticated hospital, offering a variety of medical services including surgical operations and homeopathy. Our latest research indicates that mercury was also being used to treat patients at Skriðuklaustur, in line with common practices amongst continental European and Scandinavian monasteries at the time. The brethren of Skriðuklaustur provided medical treatment to anyone who sought it, but it is unclear where the individuals buried there originally came from. Documentary evidence attests that a wide variety of people came to Skriðuklaustur during pilgrimages and for trade. This research aimed to: determine the geographic origin of individuals buried at Skriðuklaustur using stable isotope analysis (strontium, oxygen and sulphur), to note isotopic differences between two sites in Iceland, determine the diet and variations in diet between individuals, identify anthropogenic or volcanogenic exposure to toxic earth elements and to consider the effects of elevated elemental concentrations and infectious diseases on stable isotope ratios.

11 POTTERY FEATURES AS AN INDICATOR OF MIGRATIONS IN TRANS-URALS REGION IN IV-VII AD

Author(s): Zelenkov, Alexander (University of Tyumen)

Presentation Format: Oral

The approbation of methods' morphological analysis of A.A. Bobrinsky and H. Nordström' utensils was made in the report. The aim of the research is to identify levels of interaction between the early medieval population of the Ural-Siberian region, in particular, carriers of bakal, bahmutino, nevolino and kushnarenkovo archaeological cultures (AC). The sample is composed of cemeteries' materials of IV–VII AD Kozlov, Ustyug-1, Nevolinsky, Brody, Verh-Sainsky, Birsik, Kushnarenkovsky and Lagerevsky, 20 out of them are vessels bakal and bahmutino AC, 18 – nevolino and kushnarenkovo AC. Comparison of calculations performed by using point schedules and factorial analysis in the package Statistica 10 software.

As a result, most established tradition of forming stable contour lines and the usual forms of medium proportions vessels was detected in bahmutino copies. In the West Siberian utensils found vessels, which imitated low-average proportions, indicating a change in the ideas about the form in IV–V centuries AD. Nevolino and kushnarenkovo ceramics became isolated from the other groups, a large proportion of the form of imitations of low-medium and medium-high proportions was recorded in their samples.

As a result, we conclude that a common historical and cultural context of bahmutino and bakal societies probably had a single substrate at the beginning of their formation. Low-average proportions in the sample nevolino speak in favor of close ties populations in IV–V centuries AD. They manifested in the transitional forms of pottery. The concept of form kushnarenkovo potters changed under the influence of the carriers of media forest steppe and steppe cultures of the Ural-Siberian region.

12 MOVEMENT OF THINGS RANVEIG'S CASKET AND OTHER COMMODITIES

Author(s): Kristjansdóttir, Steinunn (University of Iceland; National Museum of Iceland)

Presentation Format: Oral

Igor Kopytoff's approach to the shifting characters of things has proved to be beneficial in the discussion of materiality of commodities. In his paper, The cultural biography of things, from 1986, Kopytoff highlights commodities and commoditization as a cultural and cognitive process. Objects do not simply exist through their material presence, as they synchronously inherit their own cultural and social biography. In this lecture, Kopytoff's "object biography" will be re-visited through the lenses of geographical and temporal movement of things. Three objects will be used as examples, each representing their shifting characters that at the same time demonstrate the historical development of Europe from the early medieval times to the present. The objects include 1) an 8th century shrine that was brought from Ireland by the Vikings to Norway but ended in Denmark after the Lutheran Reformation, 2) a drinking horn made in Iceland for the king of Norway but it is now preserved in Denmark, and 3) a 12th century, artfully carved door that seems to have initially been made for the monastery in Keldur, South Iceland, but was later used as a dowry and thus moved to Valbjófsstaður, East Iceland. There it was used as a church door until it was sold to Denmark in 1830 but was handed back to Icelanders when they gained independency from Denmark 100 years later.

13 SKILLS AND IDEAS – THE MIGRATION OF GLASS WORKERS IN POST-MEDIEVAL ESTONIA

Author(s): Reppo, Monika (University of Tartu)

Presentation Format: Oral

In 1628, a remarkable thing happened. On a small island in the Baltic Sea, Jost Wentzell, a foreigner, started working as the glass master for the first known glass factory in Estonia at Hüti. Without archaeological data, we would only know a glass factory was supposed to be built at Hüti – but without written records the excavations would have never been carried out. Jost Wentzell's activities have not been recorded, so only excavation results characterise the factory during his time. The importance of an interdisciplinary approach in the study of glass production in Estonia has been undeniable. From written records we know that, already from 1628, only foreign workers were allowed to produce glass while locals were used as simple labourers until the beginning of the 19th century. As a result, migrant workers had a direct influence on the development of the Estonian glass industry. This presentation explores the role of foreign workers in the development of the glass industry through archaeological and archival records, combining data from genealogical studies, wills, probate inventories, recorded biographies, and development of place names with excavated material culture from main production and consumption sites. An examination of the patterns and factors that affected the movement of glass-producing skills and technologies will be presented. The development of consumptive behaviours and attitudes towards glass as a commodity in post-medieval Estonia will also be explored, focusing on a turbulent period that saw the country move from

Swedish to Russian spheres of influence.

14 THE COMPLEX APPROACHES OF ARTEFACT-ARCHAEOGENETICS

Author(s): Gerber, Dániel (Institute of Archaeology Hungarian Academy of Sciences - Budapest VII; Department of Genetics, Faculty of Sciences, Eötvös Loránd University) - Koncz, István - Tóth, Zsuzsanna (Institute of Archaeological Sciences, Faculty of Humanities, Eötvös Loránd University) - Szécsényi-Nagy, Anna - Mende, Balázs Gusztáv (Institute of Archaeology Hungarian Academy of Sciences - Budapest VII)

Presentation Format: Oral

Nowadays, it is evident to apply such scientific methods as genetics in archaeology, whose advancing technologies allow us to analyse almost any kind of organic material. The greatest innovation in this approach is the new generation sequencing (NGS) technique, which is routinely used in archaeogenetics. Taking advantage of this technology, our research team started to have a focus not only on human population history, but also on organic artefacts found in archaeological context, namely ivory objects - jewellery and game pieces - unearthed from various sites of the Carpathian Basin. The study of these materials may provide us glimpse about past trading routes and environment. However, the difficulty of analysing these artefacts is beyond the classic archaeogenetic challenges due to the extremely low quantity and quality of DNA preservation. The archaeogenetic methodology has started to rely more on bioinformatic evaluation than classical wet laboratory works, and in this case which approach is much more critical. Currently used methods barely eliminate contaminants effectively, and they fail to obtain and validate satisfactorily the true endogenous content in a regular workflow. The reason for these issues is mostly because most of the artefacts were exposed to the environmental effects long before their burial. However, solutions do exist to overcome these problems both on molecular and computational level. In this review we go through the theory and application of artefact-archaeogenetics covering its possibilities and limits, and as a case study I present our project on the study of early medieval ivory artefacts in context of identification of species and origin.

15 MIGRATIONS AND BIOARCHAEOLOGICAL RESEARCH

Author(s): Jakob, Tina (Durham University) - Walser III, Joe (University of Iceland; National Museum of Iceland)

Presentation Format: Oral

This study aims to review the different area of migration studies using human skeletal remains from archaeological contexts that have been developed over the last decades. Population movements on various scales are being evaluated using a range of methods such as ancient DNA analysis, stable isotopes (strontium, oxygen, lead and sulphur), but also more 'traditional' methods such as non-metric traits (anatomical variations), metric variation and palaeopathological lesions in form of infectious diseases, stress indicators and traumatic lesions. However, each of these aspects has their own limitations and interpretative problems.

A wide range of reasons for migrations can be assumed using historical documents and modern proxies, however, different scales of population movements are more difficult to evaluate. For example, stable isotopic data will only be able to identify 'non-local' individuals, but the exact origin of these 'migrants' it is impossible to determine the exact origin and individuals might have moved later in life without necessarily leaving tell-tale signs in their bones and teeth.

Migrations into new geographical areas may expose individuals to new stressors and deficiency diseases, and these could potentially be seen in human skeletal remains. However, while non-specific stress indicators such as enamel hypoplasia and periosteal new bone formation can be observed it will be difficult to ascertain whether migration was a causative factor. Other problems arise when using metric and non-metric analysis to identify 'newcomers' in skeletal populations due to the range of variation within any given population. The same problems arise when using aDNA analysis, since most haplogroups are not specific to any one population.

However, if several methods of analysis are combined it might be possible to better evaluate migrations in the archaeological record.

16 CONCEPTUAL WORKFLOW AND PRELIMINARY RESULTS OF THE DEVELOPMENT OF TRANSCONTINENTAL, MULTI-FACTOR PROBABILISTIC CORRIDORS: A NEW APPROACH TO PAST MOBILITY

Author(s): Orengo, Hector (McDonald Institute for Archaeological Research, University of Cambridge) - Wilkinson, Toby C. (McDonald Institute for Archaeological Research and Churchill College, University of Cambridge) - Petrie, Cameron A. (Department of Archaeology, University of Cambridge)

Presentation Format: Oral

Mobility has been essential for the development of communications and relationships between different human groups. It forms the basis of intrinsically human activities such as trade and commerce, warfare, migration, acculturation processes and the spread of genes, germs, goods and ideas. Transcontinental routes, formed by the continuous adjoining of intra-cultural roads, played an essential role in the development of a common knowledge of the world as early as the Bronze Age with clear evidence of cultural interchange between lands so distant as Crete in the Mediterranean and Punjab in India. These are shaped by interlinked settlements and extend over territories surpassing the regional scale. Although their physical manifestation, be that roads, paths, rivers or sea routes, can have an ending, when approached at a large scale, routes join with other routes and transport networks interrelate forming a continuous web of movement possibilities, which expands in space and time.

Despite the importance of movement to comprehend the origins and development of human relationships little is understood of how

people moved in the past, how environmental conditions affected movement and how the domestication of animals and the evolving technologies of transport extended human connectivity to different ecological zones.

In this paper we address these problems by developing a network of high resolution transcontinental, multi-factor probabilistic corridors using high performance computing and open code that can be statistically related to multi-temporal settlement data and queried using spatial network analysis routing problems.

a. REDISCOVERING THE “VILLANOVANS”: NEW APPLICATION OF STRONTIUM ISOTOPE ANALYSIS TO THE ITALIAN IRON AGE

Author(s): Esposito, Carmen (Queen's University Belfast)

Presentation Format: Poster

The application of strontium isotope analysis to Italian “Villanovan” Iron Age culture enables us to re-examine conventional assumptions about ethnic origins and identity. This project is focussing on the cemetery of Fermo - a site traditionally seen as a “Villanovan” enclave - and showing the mobility of a number of different ethnic groups during the Iron Age in Italy.

Previous studies of the Fermo Misericordia necropolis have suggested that Fermo might have been a hybrid site which not only shared many elements of the ritual habitus with other Villanovan communities but also had its own unique practices. A collaborative research project between Museo della Civiltà (Rome) and Queen's University Belfast is currently using isotope analysis to explore how these shared practices came into being.

The project aims to understand how the Villanovan koine was shaped and how common traits were created in diverse Villanovan necropolises. The isotope analysis is facilitating a comparative study of material culture and burial practices which may lead to new definitions of identity.

Hitherto studies which have focused exclusively on material culture have failed to understand the complexity of the “Villanovan” phenomenon. This project points to the need for a re-examination of the concept of a “Villanovan” ethnos. It explores in a cutting edge manner how the Villanovan ethnos came into being and whether or not the movement of people might have helped to develop this sense of communality through time.

b. DID A VOLCANIC ERUPTION LEAD TO MASS MIGRATION IN THE PONTINE PLAIN AND FONDI BASIN DURING THE BRONZE AGE?

Author(s): van Leusen, Martijn - Alessandri, Luca - Attema, Peter (University of Groningen) - Doorenbosch, Marieke - Field, Michael (University of Leiden) - Sevink, Jan (University of Amsterdam) - van Gorp, Wouter (University of Groningen) - Bakels, Corrie (University of Leiden)

Presentation Format: Poster

Around 1995 BC, during the Early Bronze Age, a giant eruption of Mount Vesuvius buried a flourishing landscape of villages and fields in the plains to the north and east of the volcano under more than a meter of ash. Inhabitants of Campanian sites such as Nola (‘the Bronze Age Pompeii’) could barely escape with their lives. Italian archaeological research since the 1980s has conclusively shown that the population of the Campanian plain did not fully recover for several centuries after this so-called ‘Avellino’ event. Oddly, no one has yet wondered where the substantial Early Bronze Age population of Campania could have flown to, and what impacts it would have had there. In The Pontine plain and Fondi basin (Lazio, Italy), the distal Avellino tephra is preserved in lacustrine and marshy deposits. At the same time, an increase in population density is observed from the Early towards the Middle Bronze Age. To test if there may be a connection of the Avellino eruption and migration into the basins of Lazio, a palaeogeographical and palaeoenvironmental reconstruction has been made. Additionally, excavations at archaeological sites in the plains and caves adjacent to the plains have been made to improve knowledge on the regional Bronze Age chronology. Tephra characteristics have been investigated, including toxic elements, grain size distribution and its depositional environment. Additionally, initial palaeo-ecological analysis of peat in the Fondi basin shows that tephra deposition did have a local effect on vegetation, but a limited effect on regional vegetation, while the overall human signal in the pollen record is weak. This suggests that the area was thinly populated during and directly after the Avellino event. Forthcoming results of excavations, tephra toxicity and palaeoenvironmental reconstructions will improve the understanding of Early Bronze Age population in the area at the time of the Avellino eruption.

c. LONG-DISTANCE JOURNEYS OF PEOPLE AND THINGS DURING THE EARLY NEOLITHIC. A CASE OF AN IMPORTED CERAMIC VESSEL FROM RYŃSK (IN POLAND)

Author(s): Adamczak, Kamil (Institute of Archaeology, Nicolaus Copernicus University in Torun)

Presentation Format: Poster

The beginnings of the Neolithic on the Polish land are connected with the exodus of the Linearbandkeramik culture from their cradle in Transdanubia (5600/5500 BC). The LBK cultural patterns emerged almost synchronously in the southern (Little Poland, Silesia) and the northern parts of Poland (Chełmno land, Cuyavia and Pomerania). Reliability of such scenario is well-supported by the pottery analyses and 14C dating. In the long-distance journeys to a new homeland, the first farmers were traveling with their own lifestyle model. The pottery manufacturing traditions were undoubtedly a part of this cultural package. The LBK communities of southern Poland maintained contacts with their kinsmen inhabiting the Carpathian Basin as may be reflected by the stable flow-in of the Slovaki-

an obsidian. Remarkably, the artefacts made from such raw-material have not been recognized in the LBK inventories reported from northern Poland. What causes serious difficulties in tracing the ceramic vessels that possibly could have been exchanged between the distant LBK agglomerations is the fact that the pottery manufacturing praxis shared by the LBK communities was quite uniform across the entire ecumene they occupied in Europe. Also, the phenomenon of following the same manufacturing patterns by some groups of the LBK was limiting the innovations, which might have resulted in creating a local pottery style. This work presents the results of a multidisciplinary approach to a unique ceramic vessel recovered from the LBK settlement in Ryńsk (N Poland). The main goal of the research was to investigate the foreign origin of the vessel from Ryńsk. In order to confirm a fully imported pattern of the vessel (=technology + stylistics), the examinations were concerned on the technological profile of the vessel. Therefore, the research involved the employment of the mineral-petrographic analysis coupled with spectral (LA-ICP-MS, including Si ratios, SEM-EDS, γ -ray spectroscopy) and INAA analyses.

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ARTEFACT REPORTING, SCIENCE AND SELECTION

Theme: Theories and methods in archaeological sciences

Organisers: Brown, Duncan (Historic England) - Gumbert, Barbara (Erfgoed Leiden en Omstreken)

Format: Regular session

Artefacts represent the origins of archaeology and artefact reporting remains crucial to our scientific reasoning, but among the many exciting new methods in archaeological fieldwork, are finds taken for granted? Recent studies show that even where standards for reporting exist they are not commonly applied. This session will examine the quality of artefact studies across Europe, comparing methodologies and systems of practice against our expectations, assumptions and theories. What is the future of artefact analysis and reporting?

We aim to instigate discussion of finds selection and documentation for permanent storage. In a world where archaeologists are under pressure to reduce the amount of material collected for curation, we have to ask whether current standards of analysis are good enough to permit the de-selection of finds for archive.

We invite speakers to consider the application of standards and the quality of finds analysis and reporting in their own countries. Are some artefacts treated more reverently than others and what might discrimination depend on; chronology, function, rarity? Is analysis good enough to allow the use of archived finds in future research? Does the application of scientific techniques ensure consistency and reliability in finds work? Further areas are frameworks for finds analysis and the responsibilities of freelance specialists and those who employ them. Also welcome are papers that examine this apparent disconnection between the aim of artefact reporting—integrating new data into our interpretations of the past—and actual practice, alongside the overall Theme of contemporary debates around the future of archaeological practice.

ABSTRACTS

01

STANDARDS OF REPORTING AND APPROACHES TO SELECTION

Author(s): Brown, Duncan (HE - Historic England)

Presentation Format: Oral

As an introduction to the session 'Artefact reporting, science and selection', this paper will present the finding of a survey of artefact reporting standards carried out in England. This project examined over 1,000 professional artefact reports for various chronological periods, covering a variety of materials and object types, and measured them against forty criteria developed to characterise the quality of a report. This presentation will present those criteria as well as the results of the survey but the immediate result is that fewer than 60% of the reports met more than 50% of the criteria. At the same time as finds reporting, and by extension, analysis have been shown to be unreliable, archaeologists in the UK are under pressure to select from finds assemblages in order to reduce the size of the archaeological archive that will be delivered for curation. The obvious issue that follows from this is that it should be problematic for finds to be de-selected for archive if they have not been comprehensively analysed and reported on, yet this does not always seem to be the case. This therefore is a call for more rigour in our work, in the hope that the integration of scientific approaches can underpin the analysis of finds, while we share a common aim of recovering consistent, reliable and well-presented data.

02

HOW TO SAFEGUARD ARCHAEOLOGICAL DATA FOR FUTURE ARCHAEOLOGISTS

Author(s): Grimme, Anne Hiske (Erfgoed Leiden en Omstreken)

Presentation Format: Oral

There is an ongoing debate in The Netherlands about specialists analysis and selection methods during and after excavations. Archaeological research in The Netherlands is developer funded, which means that finances play a role in the process of making choices in post-excavation. The developer generally wants to spend as little funds as possible and the archaeologist is looking for the minimally acceptable level of specialist analysis in order to answer the research questions of the projects. This causes friction

because the academic world always wants to do more and the developer always wants to do less. The central question in the debate in our country is therefore: which minimal level is acceptable to safeguard the research results?

I would like to take this discussion a step further. Despite the fact that there is a lot of debate between all the players in the archaeological world (archaeologists, specialists, the academic world and the developer) one crucial fact is often overlooked. It is remarkable that the route from find analysis towards permanent storage is hardly ever a part of the discussion we address in this session. The specialist- and site report is generally considered the end-product of an archaeological project, which is not correct. Permanent storage of our data and archaeological finds should be considered the end-point of an archaeological project. It is the place where we store our information so that we can access it in the future and use it for new research. We can ask ourselves whether the process from specialists analysis and artefact reporting to permanent storage allows and safeguards future research.

This paper discusses ways of necessary cooperation between archaeologists/specialists and curators to achieve this goal.

03 TESTING A METHOD OF NEOLITHIC CERAMIC ANALYSIS

Author(s): Escribá Ruiz, M^a Pilar - Molina, Lluís - Bernabeu Aubán, Joan - Jiménez-Puerto, Joaquín (Universitat de València)

Presentation Format: Oral

A priority goal for archaeologists should be to refine the methodology of selection and analysis of materials, trying to follow an objective, logical, reproducible and affordable procedure; In short, using a scientific method in the study of Heritage. Over the years, handcrafted Neolithic pottery has been studied in many different ways, trying to solve the complexity of a non-standardized material product as opposed to other subsequent productions.

We, at the Universitat de València (Spain), propose a global vision for selection and analysis of this type of material culture, where the three main characteristics of a ceramic vessel are included: typology, decoration and technology. All these data are collected in a customized database where Archaeological Heritage useful information is stored.

We believe this approach is bringing multiple advantages, such as: it can be used in any other equipment for the study of other sets of handcrafted pottery, allowing comparison among studies, also quantitative aspects can be treated mathematically, and each different ceramic productions are better characterized which allows a full address to the operational chain, diachronic studies and information transmission, to name a few.

In this conference, objectivity of our method is tested by comparing two double-blind researches conducted by a pick of researchers from the same team. In addition to the archaeological information provided by the study as such, our working method has been further improved, in such a way it is homogeneous, standardized and reproducible.

04 ARCHAEOLOGICAL AUTOMATIC INTERPRETATION AND DOCUMENTATION OF CERAMICS: PRESENTATION AND RESULTS OF ARCHAIDE PROJECT

Author(s): Miguel Gascón, Eva (Universitat de Barcelona; Cultura Material i Arqueometria UB - ARQUB-GRACPE) - Anichini, Francesca (Università di Pisa) - Green, Katie (University of York)

Presentation Format: Oral

Pottery studies approach us to the comprehension and dating of archaeological contexts, and are necessary for understanding social interactions and economic dynamics. Today, characterisation and classification of ceramics is carried out manually, through the expertise of specialists and the use of analogue catalogues.

In order to optimise and economise this process, ArchAIDE project (funded by the European Union's Horizon 2020 research and innovation programme) aims to create a new system for the automatic recognition of archaeological pottery from excavations around the World. The ArchAIDE project will develop a new app that aims to change the global practice of archaeology, thanks to the latest automatic image recognition technology.

ArchAIDE will support the classification and interpretation work of archaeologists (during both fieldwork and post-excavation analysis) with an innovative app designed for tablets and smartphones, designed to be an essential tool for archaeologists. Pottery fragments will be photographed, their characteristics sent to a comparative collection, which activates the automatic object recognition system, resulting in a response with all relevant information linked, and ultimately stored, within a database that allows each new discovery to be shared online.

In this paper we will present ArchAIDE's database design and the preliminary validation of the first digitalization system prototype on sample datasets.

05 WORKING WITH ARCHIVE PROJECTS IN SCOTLAND: THE OPPORTUNITIES AND THE CHALLENGES

Author(s): Brown, Lisa (HES Historic Environment Scotland)

Presentation Format: Oral

Scotland's Archaeology Strategy is a ten-year strategy for the archaeology sector, which is helping to guide the way that Scottish archaeology is delivered, understood, cared for and celebrated. A number of aims within this strategy highlight the importance of archaeological archives, ensuring that they are studied, deposited, and curated to high standards, as well as made accessible for researchers now and in the future. Making the most of archives, and potential within incomplete legacy projects, is flagged within

its delivery plan.

HES's Archaeology Programme funding is led by the priorities identified in the Strategy. It funds a wide variety of projects, from excavation, through finds analysis and re-analysis, archiving, PhDs and postdoctoral research, and training events. Many currently supported science-based projects rely on the material in archives, especially faunal and environmental remains, which require that the samples from older excavations have been retained by museums. In Scotland, environmental samples and faunal remains are not covered by Treasure Trove, and in times of increasing pressures on museum stores, unprocessed soil samples are not always considered a priority for retention, when compared to other finds.

In a time where the heritage sector is investigating ways of prioritising finds from archaeological excavation for retention and disposal, it is important to consider some examples of projects which are utilising archived material, to add significantly to our understanding of the past.

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HASHTAG SCICOMM: COMMUNICATING ARCHAEOLOGY AND CULTURAL HERITAGE IN A POST-FACTUAL AGE

Theme: Archaeology and the European Year of Cultural Heritage

Organisers: Notroff, Jens (German Archaeological Institute) - Knight, Matthew G. (University of Exeter) - Dietrich, Oliver (German Archaeological Institute)

Format: Regular session

Archaeology has been engaged in a constant dialogue with the public right from its beginnings as a scientific discipline. Spectacular discoveries have stirred large-scale interest and have become positive icons associated with our field. Narratives of treasure hunt and discovery often are romanticising archaeology as adventure and bravado. On a darker side, the 20th century has seen archaeology being misused (partly by archaeologists themselves) to support political ideologies. Archaeology enjoys a wide popularity and still offers the possibility to be used in both ways quite effectively. Active science communication by archaeologists is essential to avoid misuse of our subject.

Traditional outreach, like museums and popular books or articles, have been complemented by new digital tools in past decades. But whatever approach is chosen, one element remains of critical importance: credible experts and communities, who can convey the essence of archaeological research to the public. This is the point where science in general and archaeology in particular have become vulnerable recently. We live in a time, in which facts seem to have become negotiable, and 'alternative facts' can be proposed. The past now is discussed on new platforms, far removed from academia. How can archaeologists keep their role as interpreters and communicators of the past (and should we)? In which ways can we credibly counter attempts to misuse archaeological data and cultural heritage? What are the best ways to reach out to and engage with the public? How can approaches be assessed so that past unethical communication practices may be discontinued?

ABSTRACTS

01 COMMUNICATING ARCHAEOLOGY AND CULTURAL HERITAGE - INTRODUCTORY REMARKS

Author(s): Notroff, Jens - Dietrich, Oliver (German Archaeological Institute) - Knight, Matthew (University of Exeter)

Presentation Format: Oral

Since the early days of pioneering archaeologists our field of research was followed by the public with growing interest and colleagues always have been in a constant dialogue with an ever-curious audience. We would like to ask contributors and participants of the session to engage in a discussion and therefore propose the following theses - encouraging participants to already refer to these in their presentations.

1. Ask an expert! - To get a message through, we need communicators. But to create a message in the first place, you need an expert.
2. Mind the gap! - There is huge public interest in the past, in archaeology and cultural heritage. People are looking for information - if we as scientists fail to provide these (understandable, comprehensible, digestible), someone else will fill this gap - not necessarily with valuable facts.
3. Too much information? - Do we need to unfold all available data to this interested public - to guarantee absolute transparency? Or should we consider our role more as one of gatekeepers, selecting and providing certain information - embedded into a wider narrative and put into context?
4. Talking to whom? - How are we handling different levels of interest and background of different audiences? Is a 'one size fits all' approach really working or do we need to look into different approaches and different communication strategies for each audience?
5. How public is public archaeology? - Public interest in research questions is large and even growing. To which degree will we allow the public discourse to also determine specific research questions? Is the public consumer or orderer?

02 FACTS, ARCHAEOLOGY, AND LABOUR: ITS NOT JUST OUR DIRT BUCKETS THAT ARE HEAVY

Author(s): Pageau, Hanna (University at Albany)

Presentation Format: Oral

In science communication we focus on the actual act of communicating and interacting directly with the world, whether its with the public or other scientists - this may seem an obvious statement, but the importance of understanding this includes active interaction is often overlooked. These efforts, especially on social media often break down to demands of being handled by the most vulnerable people in academic populations. People of colour are expected to explain why visible diversity is important to growing the next generation of scientists. Disabled individuals have it demanded of them to explain why they should be allowed a laptop in their courses. Abuse survivors are abused countless more times when they open up and try and communicate the complexities and harsh punishments of reporting abusers within the sciences - in particular when it involves often too-held-up trips, such as the 'meme level' popularity of the drunk archaeologist stereotype.

This paper presentation will seek to examine the role of emotional labour and how ally-support in academia is central to good #sci-comm and the furthering of knowledge to the public sphere, not just within our own education communities. The labour of good allyship and taking the burden off of #margisci communities (particularly when it comes to education and protecting scientists from marginalized groups) will take the center stage, with focusing on public archaeology and cultural heritage fields and how activism and public education intersects within them.

03 RE-APPROPRIATING A COMMUNICATIVE SPACE: ARCHAEOLOGISTS ENGAGE AS A STRATEGY FOR EXCHANGE

Author(s): Schenck, Tine - Krogsrud, Linn Marie (ArchaeologistsEngage)

Presentation Format: Oral

Archaeologists are increasingly letting other people and professions communicate aspects relating to the discoveries we make. As a result, a lot of our audiences get their primary education in archaeology from e.g. journalists, movie directors, or (less often) museum guides. We want archaeologists to step up and reclaim their role as a primary communicator of our own findings. As a result we launched ArchaeologistsEngage in 2015, an international organisation wholly dedicated to enabling direct contact between archaeologists and their audience through local events.

One of the key elements of our outreach strategy is the non-hierarchical exchange of information between archaeologist and layperson, in which we strive to communicate laterally as much as possible. In our presentation, we will discuss and problematise several elements of a multilateral practice that we think are critical to re-appropriating our role as a primary source for archaeological information.

- 1) Hierarchical, traditional communication strategies are losing ground to "exciting" and interactive experiences. As professionals, how can we change our approach to remain the key providers of archaeological outreach?
- 2) We have a professional responsibility to respond to the needs of our public. The incorporation of these in outreach activities can greatly enhance public engagement with archaeology.
- 3) By increasingly diversifying our communicative practice, we can actively increase the ability of our public audience to relate to archaeology. Capturing the attention of the public audience through participation and storytelling enables archaeologists to use the power of imagination in communicating archaeology.
- 4) The perceived barrier between specialists and the wider audience must be addressed and challenged.

04 THE NEOLITHIC REVOLUTION AS NEGATIVE HERITAGE: APPRAISING A TREND IN MODERN POPULAR SCIENCE WRITING

Author(s): Anvari, Jana - Rosenstock, Eva (Freie Universität Berlin, Institut für Prähistorische Archäologie)

Presentation Format: Oral

A growing trend in popular science writing portrays the Neolithic revolution as an original sin of humankind which set in motion a host of negative developments regarding social structures, human health and the environment that in the present threaten the very life basis of the human species. Such ideas – publicised in books, magazine articles, on Youtube and in blogs – represent a debate running parallel to research about effects of the Neolithic transitions within archaeology as an academic discipline: its writers often do not (primarily) turn to archaeology to obtain data or knowledge about the Neolithic revolution, and archaeologists are often unaware of the existence of a public interest in and debate about the benefits and disadvantages of settled farming life. Based on an empirical content analysis of a representative number of sources, this presentation seeks to explore this topic as a case of failing intangible heritage management: a failure of archaeology to effectively communicate with the public about an episode in the past that is relevant to constructing identities in the present and deciding trajectories for the future. The presentation discusses how exactly it is that professional archaeological voices are sidelined in a discussion about a topic matter that is inherently archaeological (concerning the deep past, before written records) and could represent an ideal opportunity for archaeology as a discipline to demonstrate its significance in the present.

05 (H)ISTORYTELLING: FACTUALITY AND ARCHAEOLOGICAL WRITING ON THE NEAR EAST

Author(s): Schmitt, Kathrin (Freie Universität Berlin)

Presentation Format: Oral

Claiming factuality in public discourse became recently more and more difficult for researchers worldwide. On top of it archaeology is facing the gap of time lying in between past and present realities which we cannot and will never bridge completely. The remaining rest of uncertainty caused by the gap of time is impossible to eradicate from our research and its results. This effects partly the great deal of interest around the keywords fact and fiction and as of late post- or alternative facts. But before we address the issues of post- or alternative facts we need to become aware of our own ways of producing facts and their bias in archaeology.

In my paper I will focus on the linguistic aspects in archaeological fact-production, as our writing is still seen as objective and neutral, especially compared with other forms of historiographical storytelling such as non-fiction, historical novels, documentaries and so on. Doing so, I will reveal some traditionally 'hidden ideologies' in our own writing, which are mostly concealed within our structural way of dealing with past as well as present societies. While I focus on several '-isms' such as colonialism, eurocentrism or androcentrism, the archaeology of the near east is rather a case study than an isolated case. Thereby parts of the discussed issues can be transferred to varying degrees to other disciplines as well.

06 DIGITAL OUTREACH AT THE ROMAN SITE OF POGGIO DEL MOLINO AND AT THE MUSEO ETRUSCO DI POPULONIA (LIVORNO, ITALY)

Author(s): Baione, Carlo (Università degli Studi di Firenze)

Presentation Format: Oral

Social media, digital application and games provide significant opportunities to enhance the public's interaction with the archaeological material. In both museum and virtual settings, the ever increasing accessibility of content designed for web and mobile interfaces enables new experiences and forms of communication.

In any case, these practices do not make archaeological communication less of a scientific endeavor, but allow archaeologists to craft meaningful forms of interaction with the public.

The digital 3D graphic documentation of Poggio del Molino is an integral part of the workflow for better understanding the multilayered archaeological site.

Publishing the 3D models of structures and artifacts on Sketchfab also helps to communicate the scientific discoveries to a wider public. The archaeological project is digitally enhancing the public's experience to supply more detailed scientific information about the discoveries and convey these findings to a broad audience.

All of the 3D models online can be viewed with a VR headset that teleports the user into the excavation. Meanwhile, all of the features can be annotated using a digital user interface and a narrating voice guides the visit. This open virtual communication of the excavation allows scholars and visitors to have a better perception of the information that the site contains in both a scientific and an educational perspective.

Since 2016 the Museo etrusco di Populonia Collezione Gasparri integrates in person visits to the museum with a VR exhibit on Sketchfab showing digital copies of artefacts in their original context. The visitor is teleported into the Etruscan tumulus tombs in which those vases were originally deposited as grave goods before being discovered and becoming part of the museum's collection. The virtual copies are also being used during all of the conferences at the Museo etrusco as tools to improve the presentation of its materials in a scientific context.

07 HADRIANUS® HADRIAN AS A TRADEMARK

Author(s): Abonyi, Zsanett - Havas, Zoltán (Budapesti Történeti Múzeum/ Budapest Historical Museum)

Presentation Format: Oral

Today's new trend in audience is the cultural enjoyment, however, reveals that museums will face a new challenge or crisis because of that audience's changing attitude in cultural consumption. The age group of the young adults want to proactively participate in their social community. We need to acknowledge this changing culture and begin to see them in a different light.

Last year the Aquincum Museum hosted an exhibition dedicated to Hadrian to commemorate his accession to the throne 1,900 years ago. The exhibition was the part of Aquincum's "Hadrian's Year 2017" event series, which offered a whole-season program. The main goal of the branding the Hadrian's Year was attracting a new and young audience. Putting focus on the figure of Hadrian seemed like a great way to engage the young adults, because this age group still have information about him and it means that they can feel a personal attachment to the emperor. The thematic year gave us a good opportunity, because we thought that this new kind of approach of a historical figure can reposition the museum to the targeted group. In the Hadrian's Year we needed to step across our physical borders and to think bigger. It means the scope of the museum activities was extended. The exhibition, the educational programmes, the museum's social sites, but the logo and the advertising as well adapted the changing attitude. In this year we focused on creating and distributing the valuable, relevant and consistent content depending on current social needs. In our lecture we're going to highlight some of our recent initiatives as examples. It's a way that we have expanded how reach and engage the new visitors.

a. THE OTHER KIND OF FIELDWORK. ARCHAEOLOGICAL EDUTAINMENT, POPULARISATION AND REENACTMENT ACTIVITIES OF THE SOCIETY OF ARCHAEOLOGY STUDENTS

Author(s): Kozicka, Magdalena - Wielocha, Ewa (Institute of Archaeology, Nicolaus Copernicus University in Toruń)

Presentation Format: Poster

In recent years, education and popularisation of archaeology and archaeological heritage have gained high importance, not only in broadly understood heritage and museum sector but also in an academic environment. Popularisation of academic research and studies within a wider intellectual culture have been recognised as an effective way to make a social impact and to attract potential students, as well as to build and promote a positive image of archaeology and archaeologist in society. In many cases, academic institutions are conducting or participating in numerous popularisation projects, making archaeological knowledge accessible to wider audiences through various means and mediums. One of them is engaging in cultural and educational events that are often connected to cultural heritage places, attracting many archaeology and history enthusiasts.

Society of Archaeology Students is one of the student organisations functioning in conjunction with Institute of Archeology and Faculty of History at Nicolaus Copernicus University in Toruń, Poland. Since 1995 the Society's interests were focused around archaeology in relation to various aspects of medieval, especially late medieval everyday life reenactment. Our activity includes archaeological education and popularisation of academic archaeology through participating in cultural, tourist and reenactment festivals and other similar events that are recognised not only on the local scale but also on national level. Over the last years, we tried various methods and approaches that can appeal to different age and interest groups and found out which of them seem to be the most effective. The following poster presents the summary of our first-hand experiences with archaeological edutainment in the field, as well as our reflections on its effectiveness and further perspectives.

b. WORKING FOR AND WITH THE PUBLIC AS PART OF ARCHAEOLOGY OF THE SITE OF VINČA, SERBIA

Author(s): Filipovic, Dragana (Institute for Balkan Studies, Serbian Academy of Sciences and Arts, Belgrade) - Penezic, Kristina (Bio-Sense Institute, Novi Sad) - Ignjatović, Milorad (Archaeology Department, Belgrade City Museum) - Tasić, Nenad (Department of Archaeology, Faculty of Philosophy, University of Belgrade)

Presentation Format: Poster

One of the aims of the most recently conducted research project focusing on the archaeological site of Vinča in Serbia was to publicise the site and the discoveries as well as the research process and methods. Thus, significant efforts were invested in increasing the interest and involvement of the public in the archaeological knowledge and its creation. The outreach activities were designed and performed by the Vinča team of archaeologists. We embraced the task and employed diverse outreach strategies, targeting a range of audiences and generating and increasing public interest in the site and its archaeology. In this way, Neolithic way of life and archaeological investigations were brought closer to the general public.

Some conventional methods were used to present and promote the archaeological work and results, including open-air displays and gallery exhibitions. A number of practical, hands-on activities were organised. The advantage was also taken of modern technologies. New approaches in presenting the sites' history were experimented with, in which Vinča archaeologists and Vinča-inspired artists jointly conveyed their impression of the site to the public. The different methods we applied in promoting the Vinča site and in communicating the archaeological knowledge can be referred to as indirect, direct, interactive and hands-on – depending on the route by which the information was conveyed to the public and the nature of the public response.

To our mind, the likely most effective, and certainly most enriching, were activities envisaged as a two-way process, enabling the flow of information between the presenters and the audience. Given the frequent misinterpretations of the Vinča site among the local audiences and interested groups, we see our efforts at reaching out to, engaging, and educating the widest-possible public as highly relevant and effective. In other words, we take outreach activities as inherent to archaeological research.

372 FRONTIERS OF MOTION? BORDERLANDS AS ZONES OF COMMUNICATION AND MOBILITY

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Salisbury, Roderick (University of Vienna) - Fábíán, Szilvia (Hungarian National Museum) - Guba, Szilvia (Kubinyi Ferenc Museum)

Format: Regular session

Borders and borderlands has become an interdisciplinary focus, particularly in geopolitical discussions. Archaeology too has traditionally been interested in how and when materials, people, ideas, and artifact and architectural styles moved between regions, as well as on the socio-political impact of these movements. This focus on how things spread from one space to another led to the creation of discrete archaeological regions separated by borders. Recent theoretical approaches have reimagined these borders as permeable, discarded "pots=people" explanations, and developed concepts of mobility. However, the communities that lived within borderlands remain under-explored, as do communication and movement within these areas. Moreover, some spaces, especially those peripheral to large, urban centers, or outside the boundaries of infrastructure and development projects, are marginalized by unintentional biases built into archaeological research. The motion or fluidity

of borders themselves needs development from archaeological perspectives, so that archaeologists can contribute to larger geopolitical debates by allowing heritage to reflect potential futures.

This session explores the role of border areas as interaction zones, comprising communities with their own traditions and structures. Can we identify “crossroads communities”? Can we see the movement of borders over time, or communities shifting from being at crossroads to being within cores? What were the long-term effects of movements of people, materials, and ideas on communities within the borderlands? How many peripheral areas were also borderlands, and how has the “marginal area” label muddled our understanding of social, political, and economic developments?

ABSTRACTS

01 INTRODUCTION TO FRONTIERS OF MOTION? BORDERLANDS AS ZONES OF COMMUNICATION AND MOBILITY

Author(s): Salisbury, Roderick (University of Vienna) - Fábíán, Szilvia (Hungarian National Museum) - Guba, Szilvia (Kubinyi Ferenc Museum, Hungary)

Presentation Format: Oral

The study of borders and borderlands has become an interdisciplinary focus, particularly in geopolitical discussions. Archaeology too has traditionally been interested in how and why materials, people, religious ideas, and artifact and architectural styles moved between regions, as well as on the socio-political impact of these movements. This focus on how things spread from one space to another led to the creation of discrete archaeological regions separated by borders. While recent theoretical approaches have reimagined these borders as permeable and rejected the “pots equal people” concept, communities within borderlands remain under-explored. Moreover, the motion or fluidity of borders themselves needs development from archaeological perspectives, so that archaeologists can contribute to larger geopolitical debate. This paper introduces the concepts of border areas as interaction zones containing communities with potentially distinct traditions and structures. We want to know how many so-called marginal areas were also borderlands, and how the “marginal area” label has muddled our understanding of social, political, and economic developments. We also address the questions of how we can identify crossroads communities, and where and how we see evidence for the fluidity of borders in the archaeological record. We explicitly recognize the movement of borders, and the ways in which communities can shift from being at crossroads to being within core areas.

02 YOUR PERIPHERY IS MY CORE AREA: ARCHAEOLOGY AT THE EDGE AND IN-BETWEEN

Author(s): Mullin, David (University of Worcester)

Presentation Format: Oral

The concept of the core and periphery is built on assumptions about the homogenous nature of cultural groups and also on models of cultural transmission which, according to Lightfoot and Martinez (1995), are essentially colonialist and flawed. Traditionally, archaeological attention has focussed on the identification of culture groups and their archaeological signatures, but rather less attention has been paid to the edges and boundaries of such “groups”.

Southern England has dominated narratives of British prehistory. The area is rich in monuments and material culture from the Neolithic onwards and, whilst some archaeologists have equated this with culture groups (such as the “Wessex Culture of Piggott), the archaeology of areas outside southern England has been less well explored. The area to the west and north of Wessex has a less well-defined archaeological signature, fewer monuments and less rich material culture. It has other distinctive elements, such as the manufacture and distribution of stone axes, however.

The reasons for these differences, and the interaction between southern Britain and the west and north, has been little explored. During work for a PhD at the University of Reading I developed a “border perspective” to examine these relationships and this paper will explore some of the outcomes of that research.

Lightfoot, K.G & Martinez, A 1995. Frontiers and Boundaries in Archaeological Perspective. *Annual Review of Anthropology* 24, 471-492.

Piggott, S 1938. The Early Bronze Age in Wessex. *Proceedings of the Prehistoric Society* 4, 52-106.

03 THE POWER OF PLACE: INTRA-SITE BOUNDARIES AND SOCIAL TRANSFORMATIONS IN A LATE NEOLITHIC SETTLEMENT COMPLEX ON THE GREAT HUNGARIAN PLAIN

Author(s): Gyucha, Attila - Parkinson, William (Field Museum of Natural History) - Yerkes, Richard (Ohio State University)

Presentation Format: Oral

When large, permanent settlements occur, novel social and political configurations must be introduced to ensure social cohesion among the constituent subgroups. However, in these dynamic social arenas, sociopolitical structures frequently are challenged leading to fundamental transformations in community organization and governance. These processes tend to coincide with shifts in the spatial arrangements of internal social boundaries and bring about fundamental changes in the accessibility to and use of specific locations perceived as places of key importance with respect to community integrity and group identity.

In this paper, we use intra-site data from a Late Neolithic, tell-centered settlement complex, Szeghalom-Kovácsshalom located in the Körös River region of the Great Hungarian Plain, to explore how regulations and practices related to tell access and use changed over time. In the course of our research, we utilize data from several old excavations on the tell, as well as from our multi-disciplinary investigations carried out in the past few years throughout the settlement complex. Our results indicate multiple shifts in the accessibility and use of the focal tell in response to negotiations among various subgroups of the entire village related to power relations and leadership. We argue that as a result of recurring internal sociopolitical transformations, which included substantial modifications in the spatial arrangements of social boundaries, the access to the tell became restricted again in the final phase of the settlement, and these transformations may have largely contributed to the disintegration of the Late Neolithic community at Szeghalom-Kovácsshalom.

04 SOME THOUGHTS ON ARCHAEOLOGICAL BOUNDARIES FROM A NETWORK PERSPECTIVE

Author(s): Golitko, Mark (University of Notre Dame)

Presentation Format: Oral

Frederik Barth once argued that most of anthropological reasoning is based on the notion that people come in bounded types variously labeled “peoples,” “cultures,” or “ethnicities.” Archaeologists have spent much of the history of the discipline attempting to create typologies of artifacts that are reflective of these types of cultural boundaries. While long acknowledging that material culture and emic identity do not directly overlap, the search for boundaries remains a basic component of archaeological practice. Recently, Darwinian evolutionary perspectives on material culture have gained favor as a means of modelling how and why divergent cultural trajectories develop. Using a case study of ethnographic material culture from the island of New Guinea, I argue that material cultural diversification or convergence are social network processes. Networks rarely if ever have clear-cut boundaries, but instead vary spatially and socially in the density and intensity of ties. Importantly, the transmission of ideas often occurs via so-called “weak links,” relatively low intensity ties that archaeologists often ignore. These ties however may bridge the areas that archaeologists identify as marginal or boundary zones, and may be critical for understanding change in the material record. Archaeological variability in material culture sometimes tells us less about the underlying structure of social and cultural diversity than we would like to admit.

05 INTERACTING ON THE EDGES: SOCIAL NETWORK ANALYSIS PERSPECTIVE ABOUT CULTURAL FRONTIERS

Author(s): Jimenez-Puerto, Joaquin R - Bernabeu Aubán, Joan - Orozco-Köhler, Teresa - Escribá, M^a Pilar (Departamento de Prehistoria, Arqueología e Historia Antigua de la UVEG)

Presentation Format: Oral

Archaeology’s object of study is the material record. The archaeologist must try, with a wide range of analysis, to look for patterns, always following the scientific method to ensure others can replicate his research. In this context the virtual modelling reveals itself as a powerful tool. Among the modelling possibilities is the Social Network Analysis (SNA), which works under the paradigm of Network Theory and Complex Systems. These disciplines have demonstrated their possibilities to explore the problems of human societies, as they behave as complex phenomena which can’t be reduced to the analysis of the discrete elements.

SNA is the science which focusses on the study of the social relationships between a given group of actors. It brings a wide fan of mathematical metrics which can detect different traits of social networking. The two main goals of SNA are the detection of the relevant actors in the network and their associations by common traits. Last but not least SNA permits to observe the emergent effects of the system. So, to entangle with the concept of cultural border we should study the importance of an actor (archaeological site) in the network. In our case we will focus in the analysis of the betweenness centrality metric, which quantifies such relevance.

With this approach we will address the concept ‘frontier’ or ‘borderland’ from the network perspective. That is how can we propose a way to successfully analyze this concept from the point of view of the SNA paradigm, and which mathematic indicators we can look for in our data in order to investigate the notion of cultural border. Also we will provide an example, with the specific case of the Iberic Peninsula first Neolithic societies whose evolutionary process have been described, by recent studies as a cycle of growing and collapse.

06 ARCHAEOLOGICAL MATERIAL BORDERLANDS AS BECOMING

Author(s): Ferris, Neal (University of Western Ontario; Museum of Ontario Archaeology)

Presentation Format: Oral

The concept of borderland in archaeological interpretation can be offered up as a kind of shorthand for “not quite:” as in the material record of a place doesn’t quite fit within harder cultural historical constructs. Whether those material constructs mean anything beyond an archaeologist’s classification is debatable, but it does imply that temporally and spatially-specific liminal places are recognizable materially as something different and capable of offering interpretive insight from that difference. Moreover, sites within these material borderlands materially express as fluid conceptual places - a temporally transitory landscape existing through community and family engagement with internal and external social and material forces allowing those in that time and place to know the world beyond – and within – slightly differently. A critical dimension of borderland then is that these encompass people becoming: situational material processes of imagining something other at the intersection of tradition, innovation, and contingency.

One such continually fluid material borderland existed in the lower Great Lakes region of Canada, between at least 900 and 1550 CE, and is reflected neatly within a 3 km wide cluster of longer and shorter term habitation sites (the Arkona cluster) dating to between 1150 and 1300 CE; a time when distinct archaeological material traditions were known further to the east and west of this locale. Ceramic crafts, lifeways, settlement practices and mortuary programs here all reveal heightened innovation and play with material expressions beyond the borderland, and that this innovation arose from in-the-moment contingencies and from within longstanding material practices. The temporally transitory nature of this material borderland also reveals the consequences of becoming: generational transformation as the borderland moved westwards materially, though descendants may well have moved east and more materially express the other side of that borderland.

07 MOBILITY ALONG THE NILE DURING THE 2ND MILLENNIUM BCE – CASE STUDIES FROM ELEPHANTINE, EGYPT AND SAI ISLAND, SUDAN

Author(s): Budka, Julia (LMU Munich)

Presentation Format: Oral

Although the cohabitation of Egyptians and Nubians at some sites and the mobility of people across the Middle and the Lower Nile valley are traceable through the archaeological record, the cultural connectivity of the Nile valley is still a neglected field in North-east African archaeology, especially for the Bronze and Iron Ages. In particular the influence of migration along the Nile on social, political and economic developments during these eras still needs to be established. Case studies of key sites located in the border region between Egypt and ancient Sudan with both settlement and funerary remains can potentially answer such questions.

From 2013 to 2018, the European Research Council project AcrossBorders has investigated questions of settlement patterns in Egypt and Nubia in the Second Millennium BCE by means of a comparative approach. The focus of the project was on the sites of Elephantine, Egypt and Sai Island, Sudan. Both sites are located in territories of strategic value with changing boundaries and alternating ruling powers that allowed questions of ancient lives across borders and cultures to be addressed. In addition to the analysis of finds and architecture from the settlements, the mortuary evidence on Sai permitted consideration of the coexistence of Egyptians and Nubians on the island.

The paper will showcase new results of the AcrossBorders project based on the study of the material culture, here especially of ceramics, highlighting hybrid types suggesting cultural entanglement and including data from iNAA. Furthermore, the final data on the analysis of the systematic variation in the isotopic composition of strontium in the environment of Sai and its significance for exploring the origin of people and their migration along the Nile will be presented.

08 THE SEAM BETWEEN THE DESERT AND THE FERTILE LAND: CONTINUITY AND ITS ABSENCE IN THE NORTHERN NEGEV, SOUTHERN LEVANT

Author(s): Abadi-Reiss, Yael (Israel Antiquity Authority)

Presentation Format: Oral

The transition from gathering and hunting to agricultural villages in the semi-arid region of the northern Negev was also a period of change in the relationship between the desert and the fertile regions, which was expressed strongly in the border.

Cultural influences and exchange relations, from both the fertile area to the north and the arid region to the south, made the stages of change in lifestyle, economic and social, into a maverick move over a short duration in the Neolithic period. After that, relations with the fertile north regions became more significant for the next several thousand years.

A series of regional cultural entities existed in the Southern Levant in the Pottery Neolithic and Chalcolithic periods. The array of existence economy and the level of cottage industries in the borderland expresses the relations with the different climatic zones on both sides. During the Late Neolithic period, the semi-arid zone was not isolated but held relationships with its neighbors. Moreover, the entities in this area functioned as intermediary / trader to their neighbors, including exchange of goods, raw materials, animals and ideas while the primary source for artifacts was still local domestic production.

The Late Neolithic characteristics indicate a significant regional continuity in subsistence economy, settlement pattern, artifact style, technology and traditions between the end of the Neolithic period and the beginning of the Chalcolithic period in the Northern Negev. However, at the beginning of the Chalcolithic period, a cultural-economic system was established, whose close ties are with the fertile north and not with the arid south, and the southern entities separated from it to a different route. This is the period in which the paths between the desert cultures and the agricultural region were separated and rearranged.

09 MYCENAEAN AND INCISED/ ENCRUSTED POTTERY ON THE CROSSROADS OF AEGEAN AND BALKANS IN THE LATE BRONZE AGE

Author(s): Bahyrycz, Cezary (Adam Mickiewicz University of Poznan)

Presentation Format: Oral

During the Late Bronze Age valleys of Strymon/ Struma and Axios/ Vardar rivers, located within national borders of Greece, Bulgaria and Macedonia (FYROM), formed two main natural routes, which connected Aegean region with south-eastern Balkans and even temperate Europe area. With the Iskar and Morava rivers, the Danube tributaries, create natural axes linking South with the North. In the archaeological history of research, these valleys were always considered as the most important features, played a crucial role in

completing migration processes, cultural, trade and social networks between prehistoric communities.

Along the river courses there is an appreciable pattern of various kind of archaeological sites. In the material record there are visible traces of settlement sites (e.g. Kastanas, Vardarski Rid, Kofilak, Balmarchevo), cemeteries (e.g. Dimov Grob, Sandanski), as well as the most interesting – so-called fortified sites with outstanding examples of stone architecture (e.g. Kamenska Chucka, Krsto Pokrovnik).

Within all of these sites' categories, during surveys and excavations, archaeologists have collected a few kinds of pottery wares. Among them, we can distinguish here two important classes – Mycenaean and incised/ encrusted, which could be useful in investigations focused on interregional communication networks in the Late Bronze Age Aegean, as well as Balkans. Both of them are probably a sign of foreign traditions. In the case of Mycenaean – indicate more southern influences and incised/ encrusted – northern intrusions in the material culture of south-eastern Balkans.

The case study of these two different classes, recognition of shapes, decoration methods and techniques, will be a useful step giving an important glimpses into the, still not-enough researched, ideas of communication links between Aegean and Balkans and their long-term effects.

10 NATURAL WAYS, ARTIFICIAL WAYS. TRAFFIC ROUTES THROUGH THE PO PLANE BETWEEN BRONZE AND ROMAN AGE

Author(s): Boccuccia, Paolo (Museo delle Civiltà) - Capurso, Annalisa - Trocchi, Tiziano (Soprintendenza Archeologia, belle arti e paesaggio di Bologna)

Presentation Format: Oral

The connecting lines between different areas are in every age the physical place along which goods, people and ideas are moved.

The river laws that descend from the Apennines have always been the natural ways of connection between north and south and the fords of torrents near the plain were cornerstones for a direct link between east and west.

From about half of the second millennium BC the whole plain between the Apennines and the Po was taken into consideration by the reality of the terrestrial culture with the countries in a capillary and extended way with attestations of sacred places, infrastructures for agricultural use and homogeneity typological of materials, a testimony of the presence of a dense network of exploitation and control of the plain. After the collapse of this culture the Po Plane appears depopulated and subsequent archaeological evidence, at the beginning of the millennium BC, emerges as the aggregation of the population goes to position itself soon in relation to the control of the natural ways access to the plain with Apennine provenance both of the fords of streams at the border of the plain. With the passage of time, a series of east-west routes, more evidenced by the new territorial structure and the changed connection needs.

There is no doubt in the Po Plane to the plant of Via Emilia in 187 BC, which provided the backbone of the system of territorial organization of the Roman age, no artificial arenas of connection are documented in such a large space that it leaves written archaeological testimonies directly on the ground.

The archaeological documentation concerns the distribution of the people from bronze age and roman age can help to understand the transformations of the territorial structure and of the management of the territory during the course of time.

11 FRONTIERS AND MOBILITY ACROSS THE ALPS IN THE LONGUE-DURÉE: COMPARING IRON AGE GAULS AND EARLY MEDIEVAL FRANKS IN NORTH-EASTERN ITALY

Author(s): Panato, Marco - Saccoccio, Fabio (The University of Nottingham)

Presentation Format: Oral

The Alpine chain was often described in the classical sources as an insurmountable geographical boundary between the Italian peninsula and the rest of continental Europe. Archaeological evidence, on the other hand, shows that this is not the case. Throughout prehistory, a range of human groups crossed the Alps to Italy, inevitably affecting pre-existing societies to various degrees.

In this paper we shall discuss, from an archaeological and historical point of view, the effects of newcomers on the existing socio-political and economic scenarios of North-eastern Italy. The migrations of Iron Age Gauls (7th-2nd c. BC) and Early Medieval Franks (8th-9th c. AD) will be used as a case-studies in order to compare the resulting interaction effects in a specific area (the present-day regions of Lombardy and the Veneto, and the Trentino area) in different historical phases.

This comparison will allow us to examine communication vectors (mainly rivers and Alpine valleys) and also their role as frontiers through time. Rivers, as well as the Alpine passes, formed a crucial network with socio-economic implications in linking societies and allowing the maintenance of contacts with transalpine territories. The analysis will take into account different kinds of evidence such as material culture, settlement and funerary pattern as well as written documentation, all crucial for a critical evaluation and understanding of the case-studies analysed.

12 PYRENEAN AGREEMENTS BETWEEN POINTS, ARROWS AND ZONES: “LIES ET PASSERIES” REREAD WITH GRAPH THEORY

Author(s): Le Couedic, Melanie (University of Pau and Pays of Adour)

Presentation Format: Oral

Treated between Spanish and French valleys, pacts between valleys, districts or villages, agreements on the management of Pyrenean natural resources are numerous and sometimes still very topical. They can be found in texts from the Middle Ages to the present day. Subjects of an abundant bibliography, in particular the international treaties of “lies and passeries”, these agreements have been the subject of few graphic representations except for some general cartographies, at the scale of the massif, in the form of dots (Brunet 2002) or arrows (Lafourcade 1998). We will come back to these representations by asking ourselves, on the one hand, about the scale of the territorial entities concerned and, on the other hand, about the terms of the agreements concerning the movement of herds and pastures that are subject to undivided enjoyment. The latter, straddling the border, a sort of buffer zone in compascuity, are most of the time shared not only spatially, but also temporally (daily, monthly alternation). What does this imply in terms of material traces, detectable by archaeology on these frontiers? Finally, we will attempt to analyze these neighbourhood agreements from a network perspective using graph theory, with the aim of looking at these “classical” sources in a new way and making complex data intelligible.

13 THE IPOLY RIVER AS BORDER OR CHANNEL OF COMMUNICATION? CASE STUDY/NEW RESULTS OF THE ISZAP-PROJECT (NE-HUNGARY)

Author(s): Guba, Szilvia (Ferenc Kubinyi Museum) - Fábíán, Szilvia (Hungarian National Museum) - Salisbury, Roderick B. (University of Vienna) - Czifra, Szabolcs - Larsson, Nicklas (Hungarian National Museum) - Szilágyi, Kata (Ferenc Móra Museum)

Presentation Format: Oral

The Ipoly Basin forms an east-west connection between the Eastern Slovakian Plain and the Danube valley, and between important raw material deposits (copper ore, Tokaj obsidian). This region is an interesting case study in that it has been marginalized in archaeological research due to geopolitical remoteness and lack of major infrastructure projects to drive archaeological surveys. Archaeological evidence, however, suggests that this region was anything but marginal during later prehistory. In this paper, we explored the role of the Ipoly valley and its small tributaries as a potential border zone and/or focal point for interactions during later prehistory, with a focus on Neolithic communities.

The research area is located in Northern Hungary, a geographical and geopolitical border region. Geopolitically, the valley of the Ipoly river is the border between two modern states. Geographically, the Ipoly valley separates the Slovak Ore Mountains from the northern foothills of the North Hungarian Mountains while providing a transportation corridor. The first Neolithic farmers in this region are the later, eastern variants of the Central European Linienbandkeramik (LBK), mostly characterised by Notenkopf and Zseliz types. The presumed late Neolithic inhabitation may relate to increasing use of natural transport routes and to the intensification of connections among neighbouring communities. The Ipoly Szécsény Archaeological Project examines settlement patterns and material interactions for the Neolithic and other prehistoric periods in a smaller geographic area (Szécsény basin, located in the middle course of the Ipoly river) using interdisciplinary and non-destructive archaeological methods. The significant amount of Bükk type ceramics within the research area suggests a strong cultural mixing in the border zone of the eastern and western branch of the LBK. Moreover, our presentation considers the changing role of major rivers from the Neolithic period to the Iron Age.

14 FRONTIER OR FRIENDZONE?

Author(s): Bácsmegi, Gábor (Munkácsy Mihály Museum)

Presentation Format: Oral

Carefully excavated, multi-component archaeological sites provide opportunities to trace changes in interaction, mobility, and borders over time. Karancsság-Alsó-rétek is a multi-component site located at an elevation of 180-190 m in the valley of the Ménes stream in Nógrád County, northern Hungary. Investigations at Karancsság began with the opening of three excavation blocks in 2002. Parts of three occupations were excavated; components from the Neolithic include Notenkopf, Zseliz (both part of the LBK) and Lengyel elements, and in addition part of a 10th-11th century AD settlements was excavated. We excavated 84 features in the three blocks and collected animal bones, stone artifacts, and malacology samples from ca. 72 m³ (100-120 t) of anthrosol.

This area was close to the borderline of the Zseliz and Bükk cultures during the Middle Neolithic. Obsidian, limnoquartzite and Krakow-Jura flint dominated the lithic assemblages in all three Neolithic periods at Karancsság. This fact suggests long-term interactions and trade connections. Ceramics from the Bükk territory provide additional support for intensive connection between the two cultures. In this paper, we will investigate the role of valleys as a key feature in these interactions, and try to answer the question of where the “Neolithic trade” took place in this region. We will also try to reconstruct the movement of the Neolithic communities, especially for the LBK people.

15 TRUE COLOURS: EXPRESSIONS OF IDENTITY IN A LATE NEOLITHIC COMMUNITY EMBRACING MULTIPLE CULTURAL TRADITIONS

Author(s): Sebok, Katalin (Institute of Archaeological Sciences of the Eotvos Lorand University)

Presentation Format: Oral

It is a question itself whether the area near Pusztataskony in the Middle Tisza Region (Hungary), where a relatively recently unearthed site of the Tisza culture is located may counts as a border- or interference zone or not. Despite being positioned in the western fringes of the culture's occupation area the site is separated from the communities of the Lengyel complex in the west by the Theiss-Danube interfluve, and also, it is located far from the two cultures' interference area by the feet of the Northern Mountains — so technically the answer may be no. The character of its archaeological record however, together with recent results in the research of connections between the two cultural complexes might drive one in this case into reevaluate the significance of physical and social factors at work in the formation of lasting cultural connections, as well as some of our current understanding on territoriality in the era.

In 2016 a grant from the NRFI allowed us to start a three-year-long project, aimed to process the data gained at Pusztataskony in three seasons, and to reveal a pattern behind the occurrence of foreign cognitive elements in the archaeological material of the site other than the ones observed in the burials. To match possible population movement with the appearance of Lengyel type cultural traits and understand the situation observed here classical archaeological, archaeometric and bioarchaeological analyses had been carried out. The current presentation offers a survey of some results of an analysis of the ceramic material, focusing on its position as a source of information and possible roles in everyday symbolic communication as well as a summary of our recent understanding of the character of contacts between the Tisza and Lengyel populations in the Middle and Upper Tisza Region.

16 INTERACTIONS IN PLAY: MATERIAL INDICATORS OF SHIFTING BOUNDARIES FROM THE LATE NEOLITHIC TO THE EARLY COPPER AGE

Author(s): Riebe, Danielle - Parkinson, William - Gyucha, Attila (Field Museum of Natural History)

Presentation Format: Oral

Anthropological perspectives on borders vary widely, ranging from “boundaries” that restrict or prevent the movement of people to a more fluid concept of “frontiers”, which allow for the continual movement of people, ideas, and materials and thereby result in a porous border (Anthony 2007:102; see also Barfield 2001; Darling 2012). Since all interactions are in some sense limited due to enforced socio-cultural concepts regarding behavior, in this paper the term “boundary” is deliberately chosen to reflect the more restrictive interpretation for boundaries. As people participate in exchange networks, they actively play a part in the formation, alteration, and devolution of socio-cultural boundaries at various scales. Over the last 20 years, extensive investigations in the Körös Region on the Great Hungarian Plain have resulted in an unprecedented dataset to draw upon to model how socio-cultural boundaries change over time. However, reconstruction of socio-cultural boundaries cannot be undertaken through the analysis of one type of material and because of this, multiple lines of evidence will be consulted. Specifically, through stylistic (decoration techniques), typological (material type), technological (form and function), and compositional (LA-ICP-MS and p-XRF) analyses of ceramics and chipped-stone materials from Late Neolithic and Early Copper Age sites on the Great Hungarian Plain, it is possible to model interactions between communities to note how interactions impact prehistoric socio-cultural boundaries in the Körös Region.

17 ON THE SHORE OF THE HALLSTATT WORLD: CULTURAL INTERACTIONS IN EARLY IRON AGE CARPATHIAN BASIN

Author(s): Czifra, Szabolcs (Hungarian National Museum)

Presentation Format: Oral

Set beyond the fringe of the Mediterranean world, the Carpathian Basin has traditionally been portrayed as either a well-trod highway linking the Eurasian Steppe with temperate Europe or an isolated periphery of the cultural centres of the ancient world. During the Late Bronze Age-Early Iron Age transitional period, significant changes occurred in the region, which interrupted the development of local cultures and affected their traditional relationships and subsistence strategies. In the broader East Alpine region, these changes had less effect, while the eastern territories (Great Hungarian Plain, Northern Hungarian Mountains, Transcarpathia and Transylvania) were gradually involved in complex mutual interactions with the steppe world, which finally resulted in the emergence of Scythian influenced groups in the 7th century BC. As populations moved and interacted locally and regionally in the western territories of the study area (Little Hungarian Plain/SW Slovakia and Transdanubia/W Hungary), these rhythms through their crossing and exchanges set the stage for a network of interconnections among regional groups. This network functioned in a dynamic history of consolidation of newcomers and transformation (or collapse) of local Hallstatt groups with economic shifts and material cultural diffusions in both worlds. In this context, this paper will analyse cultural transformations and interactions through archaeological data.

18 THE CULTURAL IMPACT IN BORDER ZONES – TRADE AND TRADITIONS IN A ROMANO-CELTIC ENVIRONMENT. A CASE STUDY

Author(s): Schwenzler, Gerit (-)

Presentation Format: Oral

Where ever people of different cultural backgrounds come together, their cultures have impact on each other. This does not have to be a “Clash of Cultures” but is rather a long and slow process which takes decades and generations in permanent contact due to long term trade, occupation or other reasons. This can be seen in the archaeological record, but focusing on just one specific site is not enough. It is necessary to look at a site regarding other sites in its vicinity to get an understanding of a greater picture of the region.

In the paper a case study of the late Iron Age settlement of Bruckneudorf in eastern Austria in regard of the sites and finds in the region will be presented. It shall offer a picture of the impacts of various cultural backgrounds in that particular area in the first centuries BC and AD. Part of that will be a selection of features and their finds as well as of stone monuments, animal bone analysis and the historical background of nearby trade routes. It will also show the development of that border zone region to a centralized, almost suburban area which probably provided goods for nearby Celtic as well as Roman towns.

19 LIVING IN THE BORDERLAND. OSTROWITE ON THE BACKGROUND OF SETTLEMENT PATTERNS CHANGES OF THE MEDIEVAL POLISH-POMERANIAN BORDER

Author(s): Sikora, Jerzy (Institute of Archaeology University of Lodz) - Kittel, Piotr (Department of Geomorphology and Palaeogeography, Faculty of Geographical Sciences, University of Lodz) - Wroniecki, Piotr (non-affiliated)

Presentation Format: Oral

The medieval frontier between the Kingdom of Poland and Duchy of East Pomerania is an example of a border which disappeared during the course of history. For years, only historians have dealt with it. The paper will be an attempt to take part in this discussion and present a slightly different view of the problem from an archaeological perspective. My considerations will be limited to the Tuchola Forest Plain and Kraina Lakeland. This area had been the subject of intensive archaeological research conducted since the 1970's mainly by the University of Łódź as well as other researchers. The appearance of new data in recent years such as LiDAR ALS derived DEMs, results of multidisciplinary projects (Ostrowite and Obrowo) as well as information from rescue excavations has revealed a dynamic process of changing settlement patterns which can be connected with wider political and economical processes. Several turning points which led to a significant reconstruction of the settlement network such as the 10th century abandonment of a number of hill-forts, development of the local trade and settlement centre in Ostrowite in 11th and 12th c. or a colonisation movement in 13th c. can be distinguished. A pivotal moment was the Teutonic Order's conquest of these lands in the 14th c. which reset the previous settlement system. New interdisciplinary research approaches have facilitated the recognition of complex networks of supra-regional commercial contacts and particularly the mobility of borderland inhabitants. The latter are confirmed not only by artefact analysis but above all by the isotopic analysis of human remains from the cemetery in Ostrowite.

Research in Ostrowite is financed by a grants of The Polish Ministry of Culture and National Heritage and a National Science Centre (UMO-2015/19/B/HS3/02124)

20 SETTLEMENT ON THE BORDERLAND BETWEEN CULTURAL ZONES - CASE OF SANTOK IN EARLY MIDDLE AGES

Author(s): Zamelska-Monczak, Kinga (Institute of Archaeology and Ethnology PAS, Center for Prehistoric and Medieval Studies, Poznań)

Presentation Format: Oral

The early medieval stronghold in Santok is example of a center developing on the boundary of diverse cultural zones. It was located in glacial-valley, at the confluence of two rivers: Warta and Noteć (NW Poland).

The results of geoarcheological surveys conducted on site indicate that the oldest settlement was built in the 8th century on sandy island, surrounded by numerous branches of rivers, at the crossing point through valley. Initially, settlement was seasonally inhabited and worked as exchange and service point on waterways connecting Baltic economic zone with interior. In the 10th century it was rebuilt to heavily fortified stronghold. Santok transformed into a border center in structures of the first Polish state organized at that time, and hard-to-pass glacial-valley became natural border between Great Poland and Pomerania. Rivers provided local and inter-regional connectivity, integrating neighboring territories. Same time, wide, impenetrable due to flooding valley, created difficult to overcome for wandering people barrier.

The results show in culture various connections and cultural transformations appeared, and Santok developed from settlement on the borderland to important region's center and, consequently, state fortress. Despite long distances from centers, the inhabitants' culture was characterized by diversity and there is no reason to define this border zone as peripheral or secondary. An illustration of the phenomenon of combining local and universal elements are changes observed in style of ceramic from Santok what clearly reflects the hybridization process.

Combining elements of different traditions is particularly clear in areas remote from the center, situated “between” geographical or cultural zones, where impacts do not flow from one center, but from many. This promotes diversity of cultural elements and creation of new values.

21 MARGINAL OR MULTI-CULTURAL? MOVEMENT AND MOBILITY ON EARLY MEDIEVAL WALCHEREN (NETHERLANDS)

Author(s): Ten Harkel, Letty (University of Oxford)

Presentation Format: Oral

The former estuarine island of Walcheren (Netherlands) was both marginal and central: situated in the coastal borderlands of the Frankish realm, it was also a focal point for international traders, raiders and inland powers intent on controlling traffic and resources. This paper explores the duality of border locations – a conceptual shifting between being at crossroads to being within cores – as both marginal and central through a focus on the archaeology and history of Walcheren, c. AD 700-1100, drawing on bioarchaeological results, material culture and written sources. In particular, it will focus on the identities of its inhabitants in the context of evidence for movement and mobility.

Early medieval Walcheren constitutes an excellent case study to explore the concept of border zones, on three levels. It was situated on a major early medieval political boundary: between the Frankish realm and the North Sea world, between the Middle and West Frankish realms, and on the border of the powerful County of Flanders. It was situated on a topographical boundary, occupying the space between land and sea. Finally, it is situated in the vicinity of the modern political boundary between the Netherlands and Belgium, which has implications for archaeological research.

The former island of Walcheren is also rich in surviving evidence. The archaeological record is varied, including three early medieval ringforts and an early medieval coastal trading site, bearing witness to the strategic importance of this 'marginal' locality. In addition, the fragmentary textual sources emphasise its identity as a distinct region, independent from surrounding territories.

This paper will take an interdisciplinary and holistic approach, combining all available evidence to shed more light on the nature of local communities, evidence for mobility and contacts with regions further afield, in order to re-evaluate the role of border zones as catalysts for socio-political change.

22 INTERACTION AND NETWORKS BETWEEN MEGALITHIC GRAVES IN THE NEOLITHIC OF NORTHWEST EUROPE

Author(s): Menne, Julia (Christian-Albrechts-University Kiel, Institute of Prehistoric and Protohistoric Archaeology)

Presentation Format: Oral

The study here presented deals with the ways of communication and interactions between several funerary communities of megalithic graves in northwestern Germany. This area flanked by peatland and sandy heathland is situated next to the present German-Dutch border. Under the previously applied assumption of one homogenous "culture" of the western Funnel Beaker Culture (more precisely with the TRB West Group), yet different regional groups with special burial rites were detected.

The main focus of this particular study is on the sociocultural and economic links between the individual funerary communities as represented by stylistic changes in terms of the diversity of the vessels deposited. Therefore a way of a high intensive interaction is shown by the distribution of the ceramic grave goods from a selection of megalithic tombs.

There was an obvious gradual change and development in the formal and decorative pottery vocabulary, which could be seen in the different microregions within the TRB West Group. Each of these microregions had its own identity as expressed by the formal vocabulary of its funerary pottery which, however, was based on the regional formal vocabulary of the TRB West Group overall. Social and cultural areas apparent within territorial and environmental boundaries were thus influenced by contrasting identities.

Consequently, the ritual landscape as defined by the construction of megalithic tombs and by the associated funerary rites can be viewed as a process of adaptation and standardisation where patterns of contact are reflected within a dense network of social relationships.

23 A FRONTIER LANDSCAPE - LONG-TIME USE AND ETHNIC RELATIONS IN THE BORDER LANDS OF EASTERN NORWAY

Author(s): Holm, Ingunn (The Directorate for Cultural Heritage in Norway)

Presentation Format: Oral

Norway and Sweden have a long common border, from south towards north. The border between Norway and Sweden in parts of Eastern Norway is an extensive forest area called Finnskogen. This area stretches on both sides of the border. I will discuss the use of these borderlands in the medieval period and onwards. There is a rich archaeological heritage from the medieval period in these forests, indicating an active use of the forest for purposes like hunting and iron production, and later summer pasture and hay making. In the 17th century Skogfinnene (the forest Finns) migrated to this area. Skogfinnene is a group of people who originally lived in Finland, where they, probably during the medieval period, took up farming a certain sort of rye, in a slash-and-burn technique, in old spruce forest. Some of them moved to Sweden and Norway at the end of the 16th century and the beginning of the 17th century, mainly because war and scarcity of forest made the living conditions poor in Finland. They established small communities in the wide forest areas on the border between Norway and Sweden. How did they colonize the landscapes between Norway and Sweden? What

was the challenges of living in the border lands between two countries, and how did Skogfennene themselves look upon their life in landscapes that the established community in Eastern Norway looked upon as marginal? These are questions that will be discussed in my paper.

24 LAKE PEIPSI AS A REGIONAL NETWORK OF COMMUNICATION

Author(s): Karro, Krista (Tallinn University; Estonian National Heritage Board) - Roio, Maili (Estonian National Heritage Board)

Presentation Format: Oral

Lake Peipsi with its coastal areas between Estonia and Russia is a borderscape that has developed into a political border during last centuries, but earlier it has been an area of mobility and communication between different tribes living on the shores of the lake. The purpose of this presentation is to discuss the lake as a network of communication during the later period of Estonian Iron Age and early Medieval times (800 – 1300) and provide some archaeological evidence to prove those statements.

The most important topic of this discussion is the question of landing sites on the shores of Lake Peipsi. Topographically suitable places together with archaeological material speak about regional communication between the people living on the shores of the lake, in some cases probably even about communication with some farther areas (e.g. Lake Ladoga). As the archaeological material of the different shores of the lake are somewhat different, the reasons for that will be discussed as well to find out whether they are rather of sociocultural or economical matter.

From the theoretical perspective the notions of borderscape and lakescape will be mentioned to attempt a new conceptual frame for an ancient lakeside landscape such as the one surrounding Lake Peipsi.

a. RESILIENCE OF BORDERS: AN ARCHAEOLOGICAL PERSPECTIVE

Author(s): Jané, Oscar (Autonomous University of Barcelona)

Presentation Format: Poster

Borders are themselves a subject to study from various disciplines. The analysis of frontier spaces can offer a social and political radiography of the evolution of the power of the states. Having said that, an archaeological perspective when it comes to knowing the scars of borders or their evolution can indicate their depth and roots.

Thus, the study of borders is the study of dynamic elements taking into account the existing territories, societies and networks. The establishment of borders at the end of the 19th century makes under way a series of elements that go beyond the cross-border realities. This is the case of the Catalan Pyrenees, which can be used as a case study. At the same time, it is possible to establish a comparative criticism at European level of border areas based on their flexibility or rooting, as more or less permeable areas? With this intervention we intend to reflect on these frontiers that continue to move despite an apparent fixation on the territory.

All this can be analyzed both from a historical perspective and from an analysis of the cultural landscape: architecture (always in evolution), language, traditions, schedules, etc. However, “banal nationalism” has been able to represent an interruption in these evolutions and to establish superimposed borders.

375 EXPLORING THE POTENTIAL OF PALYNOLOGY IN ARCHAEOLOGICAL CONTEXTS

Theme: Theories and methods in archaeological sciences

Organisers: Lechterbeck, Jutta (University of Stavanger, Museum of Archaeology) - Jensen, Christin E. (University of Stavanger, Museum of Archaeology) - Lagerås, Per (National Historical Museums, Lund)

Format: Regular session

Present global environmental changes challenge the concepts of archaeological historicity and the antagonism of nature and culture in interdisciplinary research and heritage management. Pollen analysis is a recognized method for the interpretation of past climate variability and the dynamics of ecosystems in which humans are active agents.

Analysis of pollen from archaeological sites is complex as human agency often plays a major role in the formation of the pollen assemblage as well as the deposit. However, on-site pollen analysis has a great potential, as numerous studies since the 1980'ies have shown.

Plant macrofossils are mainly preserved in aerobic sediments when charred; their presence might be immediately linked to human activity. Pollen grains, on the other hand, may be preserved as uncharred microfossils, and reflect local and/or regional environmental conditions. Pollen analysis may thus be used to address questions of land use as well as on-site activities, like food processing, plant deposition in graves, etc. Pollen can add additional species to the botanical record. On-site pollen spectra often reflect the site formation or use of certain plants. The mapping of pollen concentrations can reveal areas of activity, e.g. threshing places.

The method is still underestimated in archaeological projects and its full potential is not always exploited. Therefore the session invites papers on the analysis of on-site material, also non-pollen palynomorphs, combined pollen and macrofossil analyses, combined on-site and off-site studies as well as experimental and present day studies on pollen dispersal and deposition with reference to land use and other activities.

01 A ROMAN WELL IN WALDGIRMES (HESSE, GERMANY) - PALYNOLOGICAL AND MICROMORPHOLOGICAL ANALYSES

Author(s): Stobbe, Astrid (Frankfurt University, Archaeological Sciences, Archaeobotany Laboratory) - Röpke, Astrid (Cologne University, Archaeological Sciences, Archaeobotany) - Rasbach, Gabriele (German Archaeological Institute, Romano-Germanic Commission, Frankfurt)

Presentation Format: Oral

Wells are promising on-site archives for palynological and micromorphological analyses. Due to waterlogging and backfill after abandonment, organic sediments are often preserved at the bottom of the well. In general, well stratification is composed of two phases: sediment infill during the usage phase and subsequent backfill with domestic debris and other sediments after the abandonment of the well. Especially sediments which have been accumulated during usage reflect different kinds of human activity in and around the settlement and are rarely preserved.

One of the oldest Roman city foundations on the right side of the Rhine is Waldgirmes. Since 1993, the Romano-Germanic Commission (RGK) has been conducting research in the settlement area, which is a civilian facility of about 8 hectares in size. According to dendrochronological data, it was founded in the year 4 BC and was abandoned as early as 10/16 AD. The site particularly came to fame by a gilded bronze horse head of an equestrian statue, which was found in one of the two excavated wells. In the other, 8 m deep well, remains of the usage phase and the well lining were preserved in a niche. These laminated sediments alternate between very organic sediments and more clastic layers. We analysed the sediments by pollen and thin sections. Deriving from different source areas, the pollen offer the possibility to gain insights into the tree species composition of the surrounding area as well as the cultivation of cereals. Horticulture is evident in form of cultural indicators among which typical Roman imports are present. Through thin section analyses, the stratigraphy and composition of sediments could be differentiated in more detail. The sedimentation took place under stillwater conditions and stratigraphy had remained undisturbed by cleaning or the fetching of water.

02 ARTEFACT POLLEN WASHES: RECOVERING POLLEN IMPRINTS OF PLANT USAGE IN ARCHAEOLOGICAL OBJECTS

Author(s): Ejarque, Ana (Université Clermont Auvergne, CNRS, GEOLAB) - Miras, Yannick (CNRS, UMR 7194, Histoire Naturelle de l'Homme Préhistorique, Département de Préhistoire, Muséum National d'Histoire Naturelle, Institut de Paléontologie Humaine, Paris) - Barbier-Pain, Delphine (Inrap Grand-Ouest; CNRS, UMR 6566, CReAAH, Université Rennes 1; Université de Bretagne Sud, GMGL, Centre de recherche Yves Coppens) - Corbineau, Rémi (CNRS, UMR 6566, CReAAH, Université Rennes 1; Aix-Marseille Université) - Riera, Santiago (Seminary of Prehistoric Studies and Research, University of Barcelona) - Ledger, Paul M. (Department of Archaeology, University of Aberdeen) - Bergadá, M. Mercè (Seminary of Prehistoric Studies and Research, University of Barcelona) - Sánchez De La Torre, Marta (Seminary of Prehistoric Studies and Research, University of Barcelona; IRAMAT-CRP2A, UMR 5060, CNRS-Université Bordeaux-Montaigne) - Martínez-Grau, Héctor - Mangado Llach, Javier (Seminary of Prehistoric Studies and Research, University of Barcelona, Barcelona)

Presentation Format: Oral

The "pollen washes" (PW) technique was developed in the 1970s in the United States to recover and analyse pollen embedded in the porous surface of artefacts – typically lithic tools such as mortars, pestles and food containers – as a means to investigate past plant usage in the prehistoric societies of the American Southwest. Pollen data retrieved from PW of artefacts have the potential to provide insights into the consumption and usage of plants by past societies (e.g. in drinks, oils, ointments, resins), as well as on the functionality of archaeological artifacts such as tools used in plant processing, gathering and storage. PW is a relatively inexpensive and non-destructive technique that was primarily developed to study lithic artefacts with a coarse porosity favoring the trapping of pollen grains, but proved of limited use when rinsing artefacts with smoother surfaces. In 2015, a pilot PW research was initiated with the goals of: 1) applying for the first time this technique to the study of artefacts from European contexts, 2) adapting the PW technique to the study of objects with smooth grain textures, such as ceramic vessels likely to have contained plant-derived products or basketry tools employed in the gathering of plants, and 3) speeding up and enhancing the washing process to achieve a more thorough and precise cleaning, which is essential for the study of smoother artefacts. We will present methodological improvements achieved so far and first results obtained within this on-going exploratory research. These show the potential of PW to reveal new insights into prehistoric use and consumption of wild and domestic plants by pre-agrarian and early agrarian societies, as well as into the functionality of archaeological objects whose interpretation is still problematic, such as macro-lithic tools (Miras et al. in press, *Archaeometry*, DOI: 10.1111/arc.12375).

03 POLLEN RECORDS ILLUMINATE DIET AND ACTIVITY: PRIVIES/COPROLITES, TRASH AND FIRE

Author(s): Scott Cummings, Linda (PaleoResearch Institute)

Presentation Format: Oral

Pollen preservation in archaeological sites has been either denied or debated for decades. While preservation conditions are very different from those in peat bogs, pollen recovered from archaeological sites contributes to interpretation of local and regional en-

vironments, diet, use of plants, and other measures of economic activity. Sampling strategy is of paramount importance to answer research questions. With a long history of sampling stratigraphically through peat, we change our focus to horizontal sampling to reflect activities and sampling discrete features to obtain definition of their use.

Pollen analysis of privy samples and coprolites contributes to understanding diet, expanding our knowledge of use of spices, fruits, and vegetables beyond that learned from the macrofloral record. Fruits such as strawberries, figs, and raspberries are well represented in the macrofloral record. Seasonings such as cloves and celery, green vegetables in the mustard and other families, and some fruits are represented primarily in the pollen record.

Pollen analysis of trash and storage features from a Chinatown occupation in California yielded evidence of adapting a southwest American plant to traditional Chinese cuisine. Recovery of Agave pollen from this Chinese community, and others in the American west, suggests substitution of local ingredients in an effort to maintain traditional feast recipes. This multidisciplinary study highlights the value of pollen analysis in identifying social adaptation to a new land and to suggest collaboration between the Hispanic and Chinese immigrants in food markets.

While common knowledge suggests pollen does not survive fire, recovery of fire-altered *Viscum* (mistletoe) pollen (99 out of 100 pollen) in an Iron Age tumulus lead to the interpretation that after the flames died down, leaving coals, flowering mistletoe plants were placed on the mound while it was still hot. If mistletoe was collected fresh, this indicates burial in the winter.

04 HOW DO NON-POLLEN PALYNOMORPHS DEFINE LATRINES? A STUDY OF NON-POLLEN PALYNOMORPHS IN DANISH MEDIEVAL CESSPITS

Author(s): Enevold, Renée (Moesgaard Museum; Department of Geoscience, Aarhus University) - Hammers, Neeke - Haase, Kirstine (Department of Archeology and Heritage, Aarhus University) - Odgaard, Bent (Department of Geoscience, Aarhus University)

Presentation Format: Oral

Field archaeologists rely on field observations of construction and fill characteristics to identify cesspits as latrines. When in doubt the archaeologists turn to the natural sciences for further exploration of the feature fill. Archaeobotanical analysis is a classical method to describe fill elements, and the content of macrofossils might lead to the distinction between human waste and stable manure. More often the distinction is less clear. To help the interpretation another proxy is sought to clarify the issue. The analysis of non-pollen palynomorphs (NPPs) may hold part of the solution. NPPs are microscopic remnants of a wide range of organisms potentially indicative of the original function. They may be remnants of the original input to the fill (e.g. parasite eggs) or remnants of fill decomposers (e.g. fungal spores). A classification of fill composition can be made based on numerical analysis and the frequencies of indicator types. This paper reports non-pollen palynomorph analysis of 18 samples from Danish medieval latrines or putative latrines. A meticulous sampling procedure was used to reassure representativity, and samples were prepared mildly for the highest recovery of non-pollen palynomorphs. Advanced multivariate statistics was performed to compare NPP composition to the archaeological interpretation and plant macrofossils recovered in the same features.

05 THE POTENTIAL OF POLLEN RECORDS FROM WELLS – A REVIEW FROM SOUTHERN SWEDEN

Author(s): Lagerås, Per (National Historical Museum)

Presentation Format: Oral

Wells are regularly found on archaeological settlement sites in southern Sweden. They originate from the Neolithic to the historic period but are most frequent from the Iron Age and later. If not dried out by later drainage, the sediment in their deeper parts usually offers good conditions for pollen preservation, and on some sites the only possibility for on-site pollen analysis. As sedimentary basins, the wells function as very small lakes with a rather small pollen source area, which means that the resulting pollen assemblages reflect the local environment. However, they are not as local as macrofossil assemblages from the same wells, and, in comparison, they give a better view of land-use and vegetation beyond the habitation site, including arable and outland pastures. Most wells have been rather short-lived before being filled up or used as waste pits, and therefore each well may only give a snapshot in time. But by analysing a series of wells with different dating, it is possible to interpret temporal change in vegetation and land use. Particularly in agricultural areas, like the plains of southern Sweden, where there are no suitable lakes or preserved peatlands to be cored, pollen records from wells make an important contribution to the land-use history of these exploited and densely settled areas. The presentation will use Swedish examples, including comparisons with other proxy data, to highlight methodological and interpretative issues of a wider interest.

06 WHAT HAPPENS WITH POLLEN GRAINS IN HEARTHST? TAPHONOMIC APPROACH TO THE POLLEN RECORD FROM ABRIC ROMANÍ LEVEL M (NE IBERIAN PENINSULA)

Author(s): Val-Peón, Cristina - Expósito, Isabel (IPHES, Institut Català de Paleoecologia Humana i Evolució Social; URV, Universitat Rovira i Virgili, Àrea de Prehistòria) - Burjachs, Francesc (ICREA; IPHES, Institut Català de Paleoecologia Humana i Evolució Social; URV, Universitat Rovira i Virgili, Àrea de Prehistòria) - Vallverdú, Josep (IPHES, Institut Català de Paleoecologia Humana i Evolució Social; URV,

Presentation Format: Oral

Taphonomic analysis of pollen assemblages involves the study of the bias related to the biostratigraphic and diagenetic processes affecting pollen grains and spores. The knowledge of taphonomic processes is an important tool to infer their depositional and sedimentation conditions on archaeological deposits, as well as the impact of anthropic activities in the pollen record preservation (Expósito and Burjachs, 2016).

A current project focused on the taphonomical study of the level M from the Abric Romani archaeological site (NE Iberia), has evidenced the existence of different alterations in the pollen assemblage. One of them is related to fire activity: the thermoalteration, appearing mainly in hearths periphery's, but also inside the fire structures.

Some authors considered fire as an extreme case of oxidation which destroys or damages pollen very rapidly when sufficient oxygen is available. However, when it survives to the fire, pollen may show a progressive darkening colouration (Campbell, 1999).

The presence of thermoaltered and unaltered pollen can have diverse causes, such as the different intensity in the cremation or the existence of different episodes of pollen deposition, among others. Here we present the results of the taphonomical analysis in order to contribute for understanding the footprint of fire activity in the pollen record and to highlight the input of the application of a more complex taphonomic perspective in the palynological analysis.

07 BRONZE AGE WELLS IN THE TRANSURALS (RUSSIA) AS MULTI-RECORD ARCHIVES - A COMBINED STUDY OF POLLEN, PLANT MACRO-REMAINS AND MICROMORPHOLOGY

Author(s): Rühl, Lisa - Stobbe, Astrid (Goethe University Frankfurt)

Presentation Format: Oral

Since 2008 we are part of an interdisciplinary DFG-funded Russian-German research cooperation in the Transural steppe in Russia, where we conduct archaeobotanical studies (palynological off-site and on-site investigations as well as plant macro-remains analyses) and micromorphology. One of our special features are the wells in the Bronze Age fortified settlement Kamennyi Ambar with a good preservation of pollen and subfossil plant-remains. They are extraordinary archives providing us with an additional data source in the semiarid steppe landscape, where only charred plant material is preserved normally.

On-site archaeobotanical investigations always need a strategy prior to the archaeological excavation and, ideally, accompany the ongoing fieldwork to respond adequately to unforeseen situations, such as special features. Due to the high groundwater level and the lack of adequate water pumps in the field, the stratigraphic documentation of lower levels was not satisfactory as the influx of water mixed up the sediments. The only method to preserve the stratigraphy of these well features was the extraction of a sediment core prior to the excavation.

The results of our combined approach of palynology, plant macro-remains analysis, micromorphology as well as radiocarbon dating together with the archaeological record considerably adds to our understanding of the Bronze Age environment and plant use in the steppe, the chronology of settlement occupation phases, water management and well construction.

08 WELL, WELL, WELL: COMPARING ON- AND OFF-SITE POLLEN SAMPLES AND HOW TO DEAL WITH THE RESULTS

Author(s): van Amerongen, Yvonne (Archol - Archaeological Research Leiden)

Presentation Format: Oral

A treeless landscape. For several decades this was the reconstruction of the environment of the Bronze Age sites situated in the area of West-Frisia, the Netherlands; an area of about 40 x 20 km. However, at most excavations, wood from many different tree species was uncovered, as well as several large mammal species clearly indicating forests. Why then are the trees missing in the pollen diagrams?

By re-assessing the old data underlying the reconstruction, it was established that only on-site features were sampled for pollen analysis, among which were wells and ditches. Indeed, the image obtained was a very open landscape, but what do you expect at a settlement? In order to investigate whether off-site pollen would show a similar image of the environment, old pollen data from cores from the Dutch Foundation for Soil Mapping (Stiboka) was obtained and re-analysed. In these cores, data from peat layers was selected that dated to the Bronze Age, and the reconstruction revealed an entirely different landscape: heavily forested!

In this paper I would like to present these striking results to start a discussion about the merit of analysing on-site pollen, especially from wells, for landscape reconstructions or for a reconstruction of human activity on the site.

09 THE POTENTIAL OF ARCHAEPALYNOLOGY IN LAKESIDE SETTLEMENTS RESEARCH. STUDY CASE IN THE EARLY NEOLITHIC SITE OF LA DRAGA (NE IBERIA)

Author(s): Revelles, Jordi (Universitat Autònoma de Barcelona)

Presentation Format: Oral

Anthropogenic sediments from lakeside settlements are not ideal archives for reliable palaeoenvironmental reconstructions given

the overrepresentation of taxa introduced by humans. However, these archives offer the possibility to obtain evidence of socioeconomic practices, due to the fact that human activities cause changes in the configuration of the pollen record. In addition, the study of pollen and NPP in archaeological sediments provides relevant data to comprehend processes of site formation. In that sense, different taphonomic processes occur in aerial/subaerial mineral deposits such as archaeological sites, which can alter the original deposition of pollen and NPP.

In this study, pollen and NPP data from La Draga (Banyoles, NE Iberian Peninsula), an early Neolithic settlement, are presented. The sampling of the archaeological site of La Draga (Sector D) followed two different strategies: a vertical sampling in order to obtain a diachronic record of the successive layers and phases; and an horizontal sampling of the 1st occupation phase (Level VII) in order to carry out an spatial analysis of pollen and non-pollen palynomorphs (NPP).

The application of integrated pollen, NPP, macrofossil and sedimentological analyses enabled understanding site formation processes, the reconstruction of palaeo-environmental evolution and provided new data about socioeconomic practices during the Early Neolithic as well as about the use of space within a pile dwelling site. In addition, the integration of bioarchaeological data from La Draga and from off-site pollen records in Lake Banyoles provided significant data for the comprehension of human-environment interactions and the scale of human impact during the Early Neolithic.

10 LAKE SEDIMENTS AS A NATURAL ARCHIVE FOR STUDYING PAST HUMAN ACTIVITIES

Author(s): Sobkowiak-Tabaka, Iwona (Ośrodek Studiów Pradziejowych i Średniowiecznych, Instytut Archeologii i Etnologii PAN) - Milecka, Krystyna (Instytut Geokologii i Geoinformacji, Uniwersytet im. A. Mickiewicza) - Kubiak-Martens, Lucy (BiaxConsult Biologische archäologie&Landschapsreconstructie) - Pawłowski, Dominik (Instytut Geologii, Uniwersytet im. A. Mickiewicza) - Janczak-Kostecka, Beata (Instytut Geokologii i Geoinformacji, Uniwersytet im. A. Mickiewicza)

Presentation Format: Oral

The reconstruction of palaeoenvironment is an important part of the studies on the Late Palaeolithic and Mesolithic settlement. Due to the specific character of the hunter-gatherer way of living, environmental conditions were significant factors in choosing hunting strategies, site location and hunting equipment or group reactions to climate changes. Equally important are multi-proxy analyses of the evidence of human impact on the landscape.

The results of pollen, macroremains, charred particles, Cladocera and diatom analyses enable the reconstruction of landscape development in two regions of Western Poland occupied by Late Palaeolithic and Mesolithic hunter-gatherer groups. Special attention is paid to the evidence of human activities recorded in the sediments of the lake located next to the archaeological sites. The presence of some types of pollen and non-pollen palynomorphs, macroscopic/microscopic charcoal and charred particles of herbaceous plants evidence the changes related to various kind of such an activity. These analyses enable the reconstruction of the fire/burning events at and/or around the sites as well as considerations whether they originate from forest and/or domestic fires, and/or burning the vegetation in the vicinity. Charred macrofossil record is also useful for the study of edible plant species collected by hunter-gatherers. In addition, Cladocera are also used in our studies as these water invertebrates are sensitive to changes in trophic status of lake and thus allows for a detailed reconstruction of eutrophication, also those induced by human impact.

Natural archives such as organic sediments offer a great potential for studying past human activities that are sometimes invisible in the archaeological record.

11 PALYNOLOGICAL EVIDENCE FROM BURIED TOPSOILS, COMBINED WITH RESULTS FROM PLANT MACROFOSSIL ANALYSES AT THE BRONZE AGE FORTIFICATION CORNEȘTI-IARCURI, NW ROMANIA

Author(s): Gumnior, Maren - Stobbe, Astrid - Herbig, Christoph (Frankfurt University, Archaeological Sciences, Archaeobotany Laboratory)

Presentation Format: Oral

Located in the Romanian Banat, Cornești-Iarcuri is the largest known prehistoric settlement in Europe, characterized by a system of four ramparts mainly attributed to the Late Bronze Age. It has become the research focus of several archaeological cooperations, including our DFG-sponsored archaeobotanical sub-project which aims to derive information on the regional and local vegetation history during the main settlement phases of Cornești. Together with the analysis of plant macroremains from excavation sites in the settlement area, palynological on- and off-site studies have been carried out for this purpose.

As pollen are generally scarce in the overwhelmingly semi-terrestrial, vertisolic soils of the region, and hiatuses are frequent in the few existing off-site archives, it is especially noteworthy that some fossil topsoils within the fortification itself bear pollen assemblages from the Copper and Iron Ages. They occur in close proximity to the ramparts which have contributed to the preservation of contemporaneous land surfaces and related palaeoecological evidence. The pollen compositions of the buried soil horizons shed light on Copper to Iron Age land use dynamics and are suited to document the process of deforestation/cutting of timber and growing intensity of crop cultivation. The diachronic processing of the plant macroremains (Copper, Bronze and Iron Age) also allows, in combination with the palynological data and finally also the zoological results, to elucidate changes in land use, nutrition and vegetation within the fortification.

12 POLLEN AND MACROFOSSIL COMPOSITION IN GRAVE MOUNDS, CULTIVATION LAYERS AND SETTLEMENT STRUCTURES – A CASE STUDY FROM SOUTHWESTERN NORWAY

Author(s): Fredh, Erik Daniel - Mooney, Dawn Elise (University of Stavanger) - Lundberg, Ida (Umeå University) - Bell Gil, Theo (University of Stavanger)

Presentation Format: Oral

Botanical analyses can be used to provide information about archaeological structures and landscape development. Here, we present the results of pollen and macrofossil analyses carried out in relation to an archaeological excavation at Øvre Øksnevad in southwestern Norway. The site consisted of more than one hundred grave mounds situated on a hill, along with areas of cultivation layers and settlement structures. The aim of the analyses was to provide information about ritual deposits and to put the graves in an environmental context. The results provided substantial information about landscape development and how the area was used during different time periods, although very few botanical remains related directly to the graves were identified. The landscape consisted of woodland that was cleared to make way for pastures, followed by a settlement phase with cultivation of cereals and flax dated to the Late Bronze Age (c. 600 BC). Later, the area was used as a grave field, and most of the cairns were built during the Pre-Roman Iron Age (c. 400 BC). A new settlement phase and some grave structures were identified during the Roman Iron Age (c. AD 100) after which the area was used for grazing until recent times. This presentation will discuss the potential and challenges of working with botanical material from complex multi-period sites.

13 FORMATION OF ANTHROPOGENIC LANDSCAPES ON MID-VOLGA

Author(s): Ershova, Ekaterina (Moscow State University; Kazan Federal University) - Vyazov, Leonid (Kazan Federal University) - Ponomarenko, Elena (Ottawa University; Kazan Federal University) - Blinnikov, Mikhail (St. Cloud State University; Kazan Federal University) - Sitdikov, Ayrat (Kazan Federal University)

Presentation Format: Oral

The Bolgar area of Tatarstan, Russia is a territory that has been occupied by various archaeological cultures from the Paleolithic time onwards, which created the grounds for continuous archaeological excavations during the last hundred years. The combination of palynological, pedoanthracological, and phytolith analyses of over 80 soil and deposit layers in 20 sites of various ages and cultural affiliations was applied to reveal the dynamics of the plant coverage and land use in the last 2000 years. Major depopulation of the area between 2300 and 1700 years ago was followed by its re-colonization in the 3rd to 5th centuries AD. At that time, the area was forested, with linden being the dominant species. Slopes adjacent to the sites were burned for swidden agriculture, as indicated by soil charcoal of specific size and concentration. The combination of *Tilia*, *Betula*, *Onagraceae*, and *Cerealia* pollen was interpreted as a signature of swidden cultivation in the pollen spectra. Swidden agriculturalists disappeared from the area by the beginning of the 7th century AD, and the area was recolonized two centuries later by the Bulgars. The techniques of swidden agriculture were applied in the beginning of the colonization; by the 10th century AD permanent fields were established in most parts of the landscape. In the 10th to 13th centuries AD, Bolgar landscapes became anthropogenic, resulting in pollen spectra consistent with a forest-steppe vegetation. Vast plowlands were interspersed with grazing grounds, the recurrent burning of forest ceased, and the forest was used as a source of firewood, with a preference for deciduous tree taxa. The pollen signature of the open anthropogenic landscape included a large proportion of *Pinus*, *Poaceae*, *Artemisia*, *Chenopodiaceae*, and of *Cerealia* pollen.

14 AGRICULTURAL ACTIVITY INFERRED FROM POLLEN AND PLANT MACROFOSSIL ANALYSES OF ANCIENT FIELDS

Author(s): Jensen, Christin (University of Stavanger)

Presentation Format: Oral

This presentation puts the focus on the potential in combining palynology and macrofossil studies from on- and off-site contexts in the documentation of prehistorical agricultural activity, exemplified by studies from SW-Norway and N-Norway.

Decades of systematical sampling and analyses of pollen and plant macrofossils from archaeological excavations in SW-Norway provides reliable empirical evidence of a Neolithic farming culture. Off-site vegetation history studies and recent on-site pollen- and macrofossil analyses on top soil stripped archaeological sites, evidence the introduction of agriculture to coastal N-Norway during the Nordic Bronze Age. In addition to fishing and hunting, farming thus probably sustained early coastal-bound settlements where and when this was appropriate.

Pro and cons in the interpretation of botanical remains in subfossil field systems is elaborated and discussed, emphasizing the importance of applying an ecological perspective on archaeological investigations. Reworking of soil substrate produces a blurred chronostratigraphic signal in on-site palaeorecords. Nevertheless, palaeobotanical analyses constitutes a major explaining variable in the pinning of agricultural activity to a site. Pollen and charred plant macrofossils function as complementary variables as they represent different biological stages of the same plant species. Seeds from crop plants and weeds commonly identified to species level are good indicators of local presence due to their short dispersal radius from the mother plant. When charred, they may derive from on-site households. Pollen are on the other hand, produced and recovered in larger amounts, and at higher taxonomic diversity, producing multiple ecological signals in the palaeorecords and reflecting a wider environmental spectrum.

15 POLLEN ANALYSES FROM SOIL PROFILES (TANANGER PENINSULA, JÆREN, NORWAY) – EVIDENCE FOR PLAGGEN CULTIVATION?

Author(s): Lechterbeck, Jutta (Arkeologisk Museum, Universitetet i Stavanger)

Presentation Format: Oral

The Archaeological Museum at the University of Stavanger is responsible for the archaeological heritage management and carries out excavations in connection with building and infrastructure projects. Here results from four profiles sampled during an excavation at Jæren will be presented. The excavation site lies in the municipality of Sola on the Tananger peninsula in the northern part of Jæren between the long settled farms Tjora in the north and Sømme in the southeast. The Tanangerpeninsula is a long settled landscape and as such rich in archaeological remains dating back as far as to the Neolithic. During the course of the excavation, four soil profiles were sampled for pollen analysis and macro remains. The aim of the botanical analysis of those soil layers was to give insights into the prehistoric and historic farming practice of the area.

Up to now very little analytical work on soils in Jæren has been done. The profiles studied here differ considerably with respect to their stratigraphy, but some of the profiles are clearly anthropogenic. Their structure indicates that material to ameliorate the soil quality was brought in. Therefore, the pollen record as such does not allow environmental or ecological interpretations as the material comes from different sources and was mixed while working the soil. However in connection with the obtained radiocarbon dates it could be shown that there were actually two phases of land use where those soils had been worked. Those two phases are connected with distinct pollen assemblages: whereas the older phase features mainly grass pollen, the younger phase is characterized by high amounts of *Calluna*-pollen. This might be the result of different land use techniques and the question arises whether the younger parts of the soil profiles were the result of some kind of plaggen cultivation.

376 TRADE AND CIRCULATION OF ANIMALS AND PLANTS IN THE MEDITERRANEAN BASIN THROUGH TIME: NEW BIOARCHAEOLOGICAL INSIGHTS

Theme: Mediterranean seascapes

Organisers: Colominas, Lúdia (Catalan Institute of Classical Archaeology) - Antolín, Ferran (Integrative Prehistory and Archaeological Science, University of Basel)

Format: Regular session

Humans have contributed and still participate in the circulation of plant and animal products and species around the world. The consequences of these have sometimes been catastrophic in fragile environments such as in small islands, while in other cases they have contributed to more resilient economies and increased food security. The Mediterranean basin has witnessed processes of animal and plant dispersal as a result of human migrations and trade on multiple occasions during the Holocene.

There is a growing archaeobiological dataset that have the potential to yield a good testimony of these processes over time and their consequences. Yet we still have vague ideas of the rhythms of adoption and routes of dispersal of many crops and domestic animals, as well as commensal animals, insects or wild plants that were also transported without a clear consciousness of it. The application of digital image analysis and biomolecular analyses to archaeobiological remains is allowing important steps forward in the identification of changes in consumption patterns, use of new plant and animal products as well as tracing the arrival of new landraces or their local development.

In this session, contributions dealing with the following topics will be welcome:

- Trade, circulation and translocation of animals and plants and factors affecting these (e.g. climate)
- Introduction of commensal animals (e.g. black and brown rat, house mouse) and synanthropic plants (e.g. *Agrostemma githago*).
- Ecological and economic impact of plant and animal circulation

Archaeozoological and archaeobotanical approaches integrated in interdisciplinary investigations will be especially encouraged.

ABSTRACTS

01 TRADE AND CIRCULATION OF ANIMALS AND PLANTS IN THE MEDITERRANEAN BASIN THROUGH TIME: AN INTRODUCTION

Author(s): Colominas, Lúdia (Institut Català d'Arqueologia Clàssica) - Antolín, Ferran (Integrative Prehistory and Archaeological Science, University of Basel)

Presentation Format: Oral

Humans have contributed and still participate in the circulation of plant and animal products and species around the world. The consequences of these have sometimes been catastrophic in fragile environments such as in small islands, while in other cases they have contributed to more resilient economies and increased food security. The Mediterranean basin has witnessed processes of animal and plant dispersal as a result of human migrations and trade on multiple occasions during the Holocene.

There is a growing archaeobiological dataset that have the potential to yield a good testimony of these processes over time and their consequences. Yet we still have vague ideas of the rhythms of adoption and routes of dispersal of many crops and domestic animals, as well as commensal animals, insects or wild plants that were also transported without a clear consciousness of it. Archaeozoological and archaeobotanical approaches integrated in interdisciplinary investigations are allowing important steps forward in the identification of changes in consumption patterns, use of new plant and animal products as well as tracing the arrival of new landraces or their local development.

The conferences that we will have the pleasure to present in this session are an excellent example.

With this formal introduction, we want to present the topic of the session and the different conferences to sets the papers into context. We will also explain where the session will lead and how it will be structured to achieve a proper development of the session.

02 ONE SEA BUT MANY ROUTES TO SAIL. THE DISPERSION OF CROPS IN THE EARLY NEOLITHIC ACROSS THE WESTERN MEDITERRANEAN REGION

Author(s): Antolin, Ferran (Integrative Prehistory and Archaeological Science, University of Basel) - Bouby, Laurent (University of Montpellier) - Jesus, Ana (Integrative Prehistory and Archaeological Science, University of Basel) - Martin, Lucie (University of Geneva/UMR 5204 EDYTEM, CNRS-University of Savoie-Mont-Blanc) - Martínez, Héctor (Departament de Prehistòria, Universitat Autònoma de Barcelona) - Rottoli, Mauro (Museo Civico di Como) - Sommières, Anne (University College London)

Presentation Format: Oral

There has been a recent increase in the research on early farming practices in several areas of Mediterranean Europe, including the Balkans, Italy, Southern France and the Iberian Peninsula. Nevertheless, the potential of using archaeobotanical analysis to understand the spread of farming across the region has not yet been as deeply explored as for the Danubian route of dispersal towards north-western Europe and the British Isles.

Is there a progressive loss of crop diversity towards the Western Mediterranean?; Are there different trends within this climatically and ecologically diverse region? Can we identify different routes of dispersion on the basis of the crop assemblages?

The aims of this presentation are, on the one hand, to provide a comprehensive overview of the state of the art on the main crops in the Western Mediterranean (only the European coast, since few data has been obtained from northern Africa) and, on the other hand, to discuss the significance of the differences perceived between regions.

One of the reasons that have made an earlier synthesis for this region difficult is that most contexts have not been radiocarbon dated. We will for this reason also include an overview of the available direct radiocarbon dates on crop remains as a proxy for understanding the rhythms of the spread of agriculture with the intention of discussing priorities for the near future.

03 ALWAYS ON THE WILD SIDE OF LIFE? FALLOW DEER ON MEDITERRANEAN ISLANDS

Author(s): Daujat, Julie (Department of Classics and Archaeology, University of Nottingham) - Hulme-Beaman, Arden (Department of Archaeology, Classics and Egyptology, University of Liverpool) - Valenzuela, Alex (Departament d'Història i Arqueologia, Universitat de Barcelona) - Evin, Allowen (UMR 5554, Institut des Sciences de l'Évolution, Université de Montpellier) - Sykes, Naomi (Department of Archaeology, University of Exeter)

Presentation Format: Oral

The complex and inter-related histories of fallow deer, both – European and Persian – with each other and with humans, is reaching back over millennia. A very special and ancient relationship with humans is evidenced by their deliberate and repeated translocation far outside their natural range and management as early as the Neolithic.

On the Continent, the story began in the Far East of the Mediterranean basin – Anatolia and Levantine coast. A story that tells that the two fallow deer can no longer be considered in isolation, as they were traditionally in the past. The translocation of fallow deer took place not just along the Mediterranean routes. However, this is where emerges at the moment, and specifically on islands, increasingly abundant evidence for interesting dynamics of human-deer relationship. Particularly, the example of Roman Mallorca shows indeed a more complicated picture of fallow deer dispersal.

If we are to understand the long, multiple and close human-deer relationship that has followed many pathways – and their integration in new landscapes – whether they were different or similar through time and space, it is crucial to be able to separate the remains of *D. d. dama* from those of *D. d. mesopotamica* and possibly identify hybrids in the archaeological record.

This paper will focus on the results of newly conducted geometric morphometric (GMM) analyses, performed on both fallow deer subspecies bones from three Mediterranean islands – Cyprus, Crete and Mallorca – from different periods. Have these introductions taken root on these islands? If yes, how did they developed over time? If not, why did they not established durably? And, what impact these introductions had on the landscapes/environments and life of the people, and for the animals themselves?

04 NEGOTIATING CROPS IN WESTERN EUROPE. ARCHAEOBOTANICAL PERSPECTIVES ON THE EXCHANGE ROUTES IN THE NEOLITHIC PERIOD

Author(s): Jesus, Ana - Antolín, Ferran (Integrative Prehistory and Archaeological Science, University of Basel) - Bouby, Laurent (University of Montpellier)

Presentation Format: Oral

The research presented here is part of a four year SNSF funded project entitled “Small seeds for large purposes: an integrated approach to agricultural change and climate during the Neolithic in western Europe (AGRICHANGE)”, directed by Dr. Ferran Antolín.

The aim of this poster is to present the first results of the PhD project. The focus of the project is to define routes of agricultural exchange in the north-west Mediterranean and its connections with the areas north of the Alps during the Neolithic period. Such a study is important in order to understand how social and economic networks contributed to the construction of resilience and identity in these areas.

The research approach adopted includes two sections, the first section focuses on compiling all the archaeobotanical information from these regions and a second section focuses on developing a new way to approach crop diversity in prehistory through digital image analysis. The practical part of the first section of the project is to study archaeobotanical samples from some of the sites and for the second section is to study recent and archaeobotanical crop remains, such as seeds of wild and domesticated poppy and chaff from cereals, using geometric morphometric analyses.

The results of this research will allow the characterisation of the status of poppy in Neolithic agriculture, tracking the routes of spread of the crops of the selected cereals (naked wheat and barley) as well as to pinpoint their diversity at a site scale.

05 ANIMAL TRADE IN THE WESTERN MEDITERRANEAN BETWEEN THE BRONZE AGE AND ROMAN TIMES BASED ON ZOOARCHAEOLOGY AND STRONTIUM ISOTOPE ANALYSES

Author(s): Valenzuela, Silvia - Nieto-Espinet, Ariadna (Consejo Superior de Investigaciones Científicas - IMF) - Trentacoste, Angela (University of Oxford) - Bosch, Delphine (UMR-CNRS 5243 - Univ. Montpellier II)

Presentation Format: Oral

Animal remains from archaeological sites reflect the animal production strategies and cultural preferences of past communities. These socio-economic decisions are visible in the species herded, their morphology (size and robustness), and their mortality profiles. Analysis of strontium isotopes from tooth enamel is now a well-established way of tracing another key aspect of animal management: mobility. It allows us to characterise the geographic range of meat provisioning at different sites and to analyse changes in this practice through time.

In this paper we combine zooarchaeology, archaeology, and strontium isotope analyses of cattle and sheep enamel to characterise animal husbandry production in north-central Italy, southern France, and the north-east of the Iberian Peninsula (present-day Catalonia) between the Bronze Age and Roman times. The zooarchaeological results reveal that there were significant diachronic changes in animal production and animal morphology in the three areas analysed. These are most visible in cattle, but caprines (sheep and goats) and pigs also display distinct size changes. Interestingly, the observed changes appear to relate to the degree of economic integration within each region, rather than purely chronological or ecological factors. Isotopic analyses show differences in animal mobility patterns between the different areas and time periods considered. Unexpectedly, cattle and sheep from the same area and period could be subject to markedly different mobility patterns.

Results suggest that the degree of economic integration and the mobility range exploited are both crucial factors to understanding animal production and husbandry strategies in the past, and that different livestock species were subject to different patterns of circulation and trade.

06 HARD WHEAT AND THE RISE OF THE MEDITERRANEAN MARKET ECONOMY

Author(s): Heinrich, Frits (Groningen University)

Presentation Format: Oral

In various places throughout the Mediterranean, a gradual shift in crop selection from hulled wheats (primarily emmer wheat (*Triticum turgidum* ssp. *diccocon*) to naked wheats (primarily hard wheat (*Triticum turgidum* ssp. *durum*) can be observed in the archaeobotanical evidence, roughly between the mid-first millennium BC into the early first millennium AD. This paper presents a model that links this trend to the gradual increase of market integration in the Mediterranean basin, which culminated during the Roman Empire into what could be defined as the first ‘single market’. With the help morphological measurements, I will show that hard wheat has certain morphological and other characteristics that make it more attractive for commercial production and export than emmer wheat, especially with respect to its transportability. This resulted in the increased importance of hard wheat. I will argue, however, that the production of emmer wheat continued to be attractive to farmers who produced cereals for subsistence or to those who grew limited amounts of cereals in addition to other crops with which they primarily engaged in market exchange. Furthermore, I will argue that hard wheat did not merely rise in dominance in response to market integration, but that it also furthered this integration and ultimately played a vital role in the rise of a Mediterranean market economy. This paper will draw on historical sources, crop chronologies based on archaeobotanical studies that will serve as qualitative time-series, and new experimental data. It will also present the results of the project Productive Landscapes. An interdisciplinary inquiry into the productivity of crop husbandry in the Roman

07 THE INTRODUCTION OF ANIMALS DURING THE ROMAN PERIOD IN TUNISIA

Author(s): Azaza, Mohamed (Universitat de Rovira i Virgili)

Presentation Format: Oral

The large size of the Roman Empire encouraged movements of animals between different environmental and climatic zones. Many animals colonized new areas by travelling on human means of transport (ships and boats). Animals were introduced to improve local livestock, accidentally or for economic or social purposes. Commensal species expanded by following movements of human populations. The introduction of the rabbit was encouraged by people who saw this animal as a useful source of meat. Animals were also introduced for amusement: wild animals seem to be transported and were used for wild games. In this present work, we intend to point out what species were introduced during the roman period in Tunisia.

First, we pointed out what species were introduced in the Roman period in Tunisia through literature. After, we compared these results with our archaeozoological samples from Zama, Djerba and Carthage sites to confirm if the species described were present in our faunal assemblage.

Preliminary results show that many species were introduced in Tunisia during the Roman period. Hares (*Lepus* sp.) were the single most important wild animal taxon in Carthage. The black rat (*Rattus rattus*) and the mouse (*Mus* sp.) were mainly introduced in late antiquity. Some dogs (Maltese breed) were brought to Carthage from Roman trading expeditions. Fallow deer (*Dama dama*) seems to be introduced in Zembra Island (North of Tunisia) in the Roman period too.

08 "COWPACITY" COMBINING ENVIRONMENTAL AND ARCHAEOLOGICAL DATA TO REASSESS ROMAN ITALIAN ANIMAL CARRYING CAPACITIES IN A GIS MODEL

Author(s): Brusseeel, Aaron (Vrije Universiteit Brussel)

Presentation Format: Oral

Historians traditionally assumed that husbandry had a limited role in the agrarian economy of Roman Italy. They identified a lack of qualitative agricultural land because of environmental constraints as the prime cause. This scarce land was needed for foods (for people) and not so much for feeds (as pasture or fodder crops).

In recent years archaeobotanical research showed that there is a rich diversity of cultivated plants that could be used as fodder and more importantly archaeozoological research showed that just about every site held mixed herds of cattle, pigs, sheep and goats.

A renewed debate emerged in which a number of revisionist historians and archaeologists tried to explain how most farmers in Roman Italy (including smallholders) could maintain more livestock than previously thought. They proposed the integration of animal husbandry and arable cultivation via ley farming and the introduction of legumes as explanations. Their arguments are valuable but they only mitigate the lack of feed in a seasonal boom and bust fodder cycle and they do not fully account for the diffusion of farm animals –and their archaeological attestations- throughout the geographically highly diverse area that was Roman Italy. Considering that the productivity of ley farming and legumes would probably still be limited in the more liminal and marginal areas.

To further the debate on Roman animal husbandry practices we will need to search for more nuanced explanations. To find those, and identify hitherto overlooked opportunities and restraints, we propose to build a GIS-model constructing a layered GIS-model. Which combines a range of datasets from geology, geography, history, palaeobotany and archaeozoology.

09 TRADE & BREED – THE RELATIONSHIP BETWEEN THE CATTLE TYPES AND THE CLAIMS OF THE MARKETS IN LATE MEDIEVAL HUNGARY

Author(s): Csippán, Péter (Eötvös Loránd University of Sciences, Institute of Archaeology)

Presentation Format: Oral

During the Late Middle Ages the intensive export of livestock from the Hungarian Kingdom increased according to contemporaneous written sources. Tax records show the custom duties paid after huge numbers of animals. The commonly known „Cattle trade” as shown in the academic literature, was widespread in the territory of the Carpathian Basin and beyond. The export of livestock was not limited to cattle – although they had the main role –, but was also extended to other domestic species e. g. horses, sheep and pigs. These data mirror the importance of this activity, which had two main destinations: the Hanza cities and the North Italian markets e.g. Venice.

But the most important question is, how can we get a compact picture about the protagonists of these animals? Is there any possibility to reconstruct the contemporary breeds of cattle?

In romantic history, supported by the awakening national self-awareness in Hungary at the turn of the 19th and 20th centuries, the iconic significance of the large, long-horned and light grey cattle, as a trademark, consolidated, but osteological evidence of these cattle type isn't to be found.

Research, until last years until recent years,, has usually focused on trade itself and not the subjects: the animals. In this paper the author presents new scientific approach to the theme, using geometric morphometrics in the analysis of cattle bones from numerous archaeological sites, which can help to recognize some possible breeds or types of Late Medieval and Early Modern Hungary.

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Sanmartí, Joan (University of Barcelona; Institut d'Estudis Catalans) - Plana, Rosa (Université Paul Valéry Montpellier 3) - Belarte, Carme (Catalan Institution for Research and Advanced Studies - ICREA; Catalan Institute of Classical Archaeology - ICAC) - Noguera, Jaume (University of Barcelona)

Format: Regular session

Since the end of the last millennium, the reflection on the processes of urbanization in the pre-Roman Mediterranean has recovered an important role in archaeological research. This has also stimulated new theoretical reflection on the definition of "urban" and on the role of urban settlements in the settlement networks.

At the same time, important archaeological surveys and extensive excavations conducted in the last decades in the area under study has revealed the existence of hierarchical settlement systems, which include settlements that, for different reasons, can be described as urban. These works, however, have also revealed the existence of a great diversity of specific situations, which invites a comparative analysis that may allow to go deeper into the definition of "urban" and the types of protohistoric towns in the area under study.

The proposed topics of discussion revolve around the causes of urbanization processes (technological changes, demographic growth, colonial relationships), the physical characteristics of the sites considered as urban (size, internal organization, structural complexity), the position of the latter within the population patterns (cities as centers of power, administration, exchange), symbolic functions of cities, craft specialization in relation to urbanization processes, sociological diversity as a defining trait of "urban", etc.

ABSTRACTS

01 DID PROTOHISTORIC CITIES EXIST IN IBERIA AND MEDITERRANEAN GAUL? SOME REFLECTIONS ON THE NOTION OF CITY

Author(s): Sanmartí, Joan - Madrid, Marisol (University of Barcelona)

Presentation Format: Oral

For historians, the urban fact, in its multiple versions and particularities, was and still is a constant, that is, a fundamentally invariant, intuitively recognized datum, and, therefore, it does not need a precise definition. For pre- and protohistorians, however, the question of the deep, essential nature of the city is a basic issue, since the formation of towns was often developed in periods still lacking in written sources, or when these, assuming that they may be read and understood (which is often not the case), are still too scarce to give us a clear image of contemporary towns. For researchers working on these periods, questions about what a city is, about the circumstances in which they appeared (or were created), and about whether the sites they discover can be described by this name, area fundamental issues. All this is reflected in the different scholar traditions within Humanities and Social Sciences: the analysis of the city has been mostly made by geographers, sociologists and prehistorians, rather than historians or archaeologists who have focused their activity on historical periods.

With this contribution we want to encourage a debate on the criteria used in the different papers when it comes to deciding which protohistoric settlements are urban in nature. The objective is to arrive at a proposal of definition of the city and of the urban life and, more concretely, of the protohistoric cities of Iberia and Mediterranean Gaul, if they did really exist.

02 LOWER WESTERN PROVENCE DURING THE IRON AGE : A LABORATORY OF THE PROTO-URBANIZATION OF SOUTHERN GAUL

Author(s): Nuria, Nin (Ville d'aix-en-Provence) - Jean, Chausserie-Laprée (Ville de Martigues)

Presentation Format: Oral

During the Early Iron Age, the lower Rhone region, and especially the territory between Marseille and Arles, saw the emergence and development, in contact with the Phocaeen colony and smaller Greek sites, of a large number of relatively large indigenous habitation sites. These were places of major architectural innovations, and they were also provided with the typical elements that are usually considered as markers of Protohistoric cities (such as defensive walls, blocks of houses, roads, public buildings). Recent digs –some of which are still unpublished– (Saint-Blaise, various sites in Martigues and around the Berre pond), as well as the reinterpretation of old data allow today a better understanding of this major phenomenon of proto-urbanization in southern Gaul.

Spread over several centuries, and after a first phase (6th century BC) of trial and error –sometimes marked by borrowings from the Greek and Etruscan world–, a real structuring pattern of agglomerated habitats became widespread during the Second Iron Age (5th-2nd century BC). This process of proto-urbanization is attested in very diverse geographical and topographical conditions, and it may be observed in almost every site of this region until the time of the Roman conquest, but lasting in some cases well into the Early Roman Empire. Through several examples from recent research, our communication will also aim, on the one hand, to determine the specific traits that distinguish in this process the main agglomerations from smaller entities, and, on the other hand, to identify and define the elements that characterize, on several sites, both the moments of rupture and innovation and those of resistance

and archaism.

03 NEW OBSERVATIONS ON THE DEVELOPMENT OF THE CITY OF ENSÉRUNE

Author(s): Boissinot, Philippe (Ecole des Hautes Etudes en Sciences Sociales; laboratoire TRACES UMR 5608 du CNRS, Toulouse) - Izac, Lionel (Monuments Nationaux; laboratoire TRACES UMR 5608 du CNRS, Toulouse)

Presentation Format: Oral

Discovered at the end of the First World War, excavated systematically until the mid-1970s, the site of Ensérune (Hérault) in Mediterranean France is now recognized as one of the major Protohistoric agglomerations in that area. It was a real cultural crossroads, with multiple influences (Celtic, Iberian, Greek, Etruscan, Italic), that was occupied from the late 6th century BC to the beginning of the Roman Empire. Several areas of the site have been excavated, and sections of streets identified, but the precise location and extent of the fortification system was unclear until recent times; some scholars went even so far as to consider the very singular case of an unfortified city, while at the same time widely open to Mediterranean trade. In this context, it was admitted that the large eastern terrace, intended exclusively for the storage of agricultural products in silos, could in fact be defenseless. The re-examination of old documentation and, above all, the discovery of new portions of ramparts in 2017, as well as the entrance area to the site (monumental access ramp), clearly indicate the existence of several fortifications, which were fit together, forming an agglomeration of nearly 30 ha. However, the question of the possible existence of suburban districts remains unsolved; the same may be said regarding the access to lagoon systems and roadways. The issue of the relations between necropolises and habitation areas is also considered; the exceptional case of a development of the latter at the expense of the former is discussed.

04 URBANIZATION, A PARTICULAR CASE STUDY IN TOLOSA, SOUTH-WEST FRANCE (2ND-1ST CENTURIES BCE)

Author(s): Eymard, Sandra (University of Toulouse Jean Jaurès)

Presentation Format: Oral

The Late Protohistoric occupation of Tolosa (2nd-1st centuries BCE) consisted of two major sites distant only a few kilometers the one to the other: a hill-top settlement of more than 150ha (Vieille-Toulouse) and a lowland settlement of more than 100ha Saint-Roch. Tolosa was the capital of the Volcae Tectosages people, whose territory stretches until the Mediterranean. Links with the Iberian and Italy regions appear to be relatively strong as evidenced by quantity and diversity of archaeological material from these areas, the only known writings are first Iberian, then Greek and finally Latin.

For a long time researchers have discussed the location of the agglomeration of protohistoric Tolosa and the role of the second site. This paper will propose comparison between theoretical criteria traditionally used to define urbanity (size, population density, permanence of structures, separation of craft and domestic areas, area devoted to the cult...) and data highlighted in the field. Our approach is based on the use of GIS which led to cross-referring data from different kinds, therefore allowing for a discussion of the nature and relationship of both sites. Contrary to pre-conceived models based on abstract definitions of urbanization processes, this particular case study needs ad hoc criteria for understanding the coexistence of two large sites only four kilometres apart.

05 CHARACTERIZATION OF URBAN SETTLEMENTS ON THE COAST OF NORTHERN IBERIA (6TH-3RD CENTURY BC)

Author(s): Sanmartí, Joan (University of Barcelona; Institut d'Estudis Catalans, International Academic Union) - Belarte, Maria Carme (Institut Català d'Arqueologia Clàssica; ICREA) - Noguera, Jaume (University of Barcelona)

Presentation Format: Oral

Research into the Iberian culture has a long history that began more than 100 years ago. It has been particularly intense in recent decades, with extensive surveys and a number of excavations at large scale. Surveys have made it possible to determine the existence of complex settlement patterns, with different categories of sites, while the digs have contributed to understanding their internal functioning and their position within settlement systems. Most of the excavated habitation sites are of small size, while the excavation of medium and large settlements has been very limited. We may mention large sites such as Ullastret (Girona) and Castellet de Banyoles (Tarragona), as well as second-order towns such as Turó de Ca n'Oliver (Barcelona). But, for the rest of the first or second order sites, the available information is clearly insufficient, and this has a negative impact on the sociological, political, symbolic and even economic characterization of the societies of Northern Iberia.

In order to overcome these shortcomings, the University of Barcelona and the ICAC are carrying out the project "Characterization of urban settlements on the coast of northern Iberia (6th-3rd century BC)", which is financed by the Spanish Ministry of Economy and Competitiveness. The aim is to obtain information that contributes to characterize urban settlements in the northern Iberian area, with special emphasis on the formation process during the early Iberian period (6th-5th cent. BC) and their transformation into first order settlements during the middle Iberian period (4th-3rd cent. BC). Methodology is based on the analysis of building remains and artefacts of the excavated sites, combined with the recovery of new data with non-destructive methods and specific verification digs. Based on the results we propose to elaborate new hypotheses on the nature of these settlements.

06 COMPLEX FORTIFICATIONS IN THE URBAN NUCLEI OF THE CATALAN COAST DURING THE IBERIAN PERIOD (6TH-3RD CENTURY BC): CAUSES AND CORRELATIONS

Author(s): Cuscó Badia, Oriol (Institut Català d'Arqueologia Clàssica)

Presentation Format: Oral

We intend to carry out an updated analysis of the fortifications of the Iberian urban centres on the Catalan coast by putting them in relation to other aspects that define the category of these settlements. Thus, we will carry out a study of the fortifications of the most well-known urban centres of the study area, paying special attention to the complexity of their defensive systems. We will then compare this feature with other aspects such as the size of the settlement, the complexity of its domestic architecture, the presence of public buildings, the signs of productive activities and accumulation of wealth, the ritual manifestations, etc. By doing so, we expect to show that the complexity of the fortifications usually has a direct correlation with these factors. Precisely, these variables are usually taken into account when assessing the "category" or hierarchical level of these settlements. Therefore, by confirming the relationship between the complexity of the fortifications and these other factors we would be able to affirm that, at least in this area, the most complex fortifications were built in the main settlements (from a political and socioeconomic point of view), and that their presence would respond, to a great extent, to the interests of the aristocratic elites who would reside in them.

07 THE IBERIAN TOWN OF ULLASTRET: URBANISATION AND URBAN PHYSIOGNOMY

Author(s): Plana, Rosa (Université Paul Valéry Montpellier) - Codina, Ferran - Prado, Gabriel (Museu d'Arqueologia de Catalunya - Ullastret)

Presentation Format: Oral

The settlement of Ullastret, in the far north-east of the Iberian Peninsula, is an archaeological site made up of two fortified agglomerations 300 metres apart. One is on the hill known as Puig de Sant Andreu and the other stands on what was once an island in the ancient lake of Ullastret (Illa d'en Reixac). This twin settlement was occupied throughout the Iron Age and was abandoned in the early years of the Roman conquest. The available documentation shows us the town planning phases of this community, which rapidly consolidated its position as one of the most important towns on the Mediterranean coast of the Iberian Peninsula. Its proximity to the Greek establishment of Emporion explains the precocity of its development, as well as the penetration of Mediterranean influences. Ullastret is an exemplary case study of the urban phenomenon and the formation of an Iberian town. If the physiognomy is original, the evolution of the town planning, mainly in the 4th and 3rd centuries BC, also shows the progressive adoption of an evolved urban form that included a separation of the different functional areas. The society, which was strongly stratified, also appears to have occupied the urban layout in a differentiated manner according to rank. This has been confirmed by the results from the most recent archaeological excavations and geophysical surveys. In summary, the parallel study of the urban and peri-urban areas allows us to shed light on the particularities of its spatial construction, as well as on how this Iberian town functioned. This rapid and complex urbanisation process is characteristic of the more open communities that were in contact with the Mediterranean colonial world.

08 EL MOLÍ D'ESPÍGOL, A CAPITAL CITY FOR THE ILLERGETES?

Author(s): Principal, Jordi (Archaeological Museum of Catalonia)

Presentation Format: Oral

El Molí d'Espígol (Tornabous, Lleida) is the largest second Iron Age centre known to date throughout the western plains of present Catalonia (i.e. the historical territory of the Illergetes). The earliest archaeological evidences are assigned to the first Iron Age (late 7th c. BCE), when a small habitat, surrounded by a strong wall with square towers, was built. In the second half of the 6th c. BCE, the site already shows signs of significant growth since a new and broader defensive perimeter (a plain wall without towers) replaces the existing one and a certain urban infrastructure is provided.

Recent research conducted at the site shows an increasing level of complexity concerning the town-planning and the defensive structures of the oppidum for the middle Iberian period (4th-3rd c. BCE): the habitat expands beyond the walls and a complex layout is fixed, which clearly differentiates the populated urban space from the suburban one where manufacturing activities are fulfilled. It clearly points to the development of a proper "urban" settlement, a protohistorical city. In addition, its landscape context and the settlement pattern of the middle/small range oppida within the region suggest the shaping of a coherent territory with a central focus or capital.

09 SETTLEMENT AND POLITICAL ORGANISATION OF THE IBERIAN COMMUNITIES OF CENTRAL AND WESTERN CATALONIA AND LOWER ARAGON

Author(s): Asensio, David (Universitat de Barcelona) - Cardona, Ramon - Garcia, Cristina (Centre d'Estudis Lacetans) - Jornet, Rafel (Universitat de Barcelona) - Morer, Jordi - Pou, Josep (Centre d'Estudis Lacetans)

Presentation Format: Oral

Many different readings have been made on the social and political structure of the Iberian territories of central and western Catalonia. Some researchers argue that ilergetes and lacetani populations would have developed centralized state-like political entities, whose territorial scope would be coincident with the geographical limits of their ethnic territories. Other scholars maintain that the genesis of this type of large, politically centralized, territories did only take place on the coastal Iberian territories (indiketes, laietani

and cosetani).

The divergence between coastal and inland territories is indeed very clear, especially with regards to the typological diversity of settlements and the hierarchical patterns that structure them. Contrary to the coastal areas, where centralised settlement systems are well attested, in central and western Catalonia there is no evidence of the existence of major, first-order towns, nor, on the other hand, of a dense network of small rural settlements scattered across the countryside. There is nothing similar to sites where large quantities of cereal surpluses were stored, indicating control over production. For all these reasons, it is possible to consider the existence of other kinds of social organisation, perhaps of a heterarchical nature, for the Iberian societies in this specific part of Northern Iberia. This assumption is confirmed to some extent by the excavations underway in several settlements that could represent the upper scale of the hierarchical structure of the settlement system in these territories, such as Tossal de la Pleta, Castellvell, Coll del Moro and the revised data of old excavations at Sant Antoni.

10 HELLENISTIC INFLUENCES IN THE PROCESS OF THE URBANISATION OF THE CELTIBERIAN CITY OF SEGEDA

Author(s): Burillo-Mozota, Francisco - Fernández-García, Gloria - Burillo-Cuadrado, M^a Pilar (Universidad de Zaragoza)

Presentation Format: Oral

The Classical writers provide us with detailed information about Segeda. It was accused of violating the Gracchus pacts by forcing neighbouring settlements to form part of the city, which increased its size and led to the construction of a new wall. This was why Roman Senate declared war on Segeda in 154 BCE.

Archaeological investigations have located Segeda in Poyo de Mara (Zaragoza), identifying the site of the new settlement and the unfinished wall marking the new perimeter. It has also been confirmed that the city was abandoned in 153 BCE and a new city constructed a few metres away, which would keep the name Segeda, in Durón de Belmonte de Gracián. This was destroyed around 76 BCE in the war between Sertorius and Pompey.

Segeda I has thus become a privileged archaeological site because its abandonment in 153 BCE means its urban structure can be investigated. Furthermore, Segeda I and the Byrsa hill in Tunisia, where the destruction of Carthage took place in 146 BCE, are the only two places in the Mediterranean that provide a safe ante quem date for the mid-second century BCE.

One of the remarkable structures discovered in Segeda is the "Sanctuary of the Sun": it is astronomically aligned, and has no known parallels. Another is the "House of the Strigil", which is an adaptation of the "houses with a central patio" found in Sicily, a model introduced by Celtiberian mercenaries.

a. REMOTE-SENSING TOOLS TO DETECT ARCHITECTURAL FEATURES IN URBAN SITES IN THE COAST OF NORTHERN IBERIA (6TH – 3RD CENTURIES BC)

Author(s): Belarte, Maria Carme (ICREA - Catalan Institution of Research and Advanced Studies; ICAC - Catalan Institute of Classical Archaeology) - Canela, Joan (ICAC - Catalan Institute of Classical Archaeology)

Presentation Format: Poster

The first urban sites in north-eastern Iberian Peninsula date from the end of the 6th century BC, and develop mainly during the 4th and 3rd centuries. The research of Iron Age settlements in this area has identified a highly hierarchical settlement organization according to the size, location and function of the sites. Nevertheless, the urban sites are the worst known, as their excavation and study offer several difficulties. They have large surfaces (about 10 hectares) and most of them lie under a dense forest cover that hides the archaeological remains. The best tools to study these settlements are thus the remote-sensing techniques, and more particularly the use of LIDAR data (Laser Imaging Detection and Ranging). The method is based on the emission of laser lights and the measurement of the reflected pulses, in order to generate a point cloud representing the earth's surface (DSM). The model includes every item of the relief elements, such as vegetation. We can then select the elements of the topography, suppress the vegetation and obtain a high resolution MDT. This allows highlighting small reliefs created by the anthropic action, through specific filters and the use of GIS programmes. In this poster we present the preliminary results obtained from the application of these methods to a selection of settlements in the coastal area of the north-eastern Iberian Peninsula.

b. THE PROTOHISTORIC SITE OF LA CELLA (SALOU, TARRAGONÈS, TARRAGONA). A MIXED ETHNIC COMMUNITY OF MEDITERRANEAN ORIGIN

Author(s): Serret, Ivan - Diloli Fons, Jordi (Universitat Rovira i Virgili) - Vilà Llorach, Jordi - Bricio Segura, Laura (Grup de Recerca Seminari de Protohistòria i Arqueologia - GRESEPIA)

Presentation Format: Poster

The protohistoric site of La Cella (Salou, Tarragonès, Tarragona) is nowadays one of the main urban centres of Cessetan's seacoast. Excavated since 2010 by the Grup de Recerca Seminari de Protohistòria i Arqueologia (GRESEPIA) de la Universitat Rovira i Virgili (URV), it is located at the top of a hill that rises to coast and controls the entire bay of Tarragona. This settlement presents some urban and architectural features that are completely atypical in the Iberian context of the region. Although the constructive techniques are thoroughly autochthonous, we have to notice that there is a perfectly calculated urban planning that follows a foreign metrological pattern, probably Punic. Orthogonal large streets and complex buildings that exceed 100 m² articulate it.

The abundant presence of ceramic import materials, mainly Punic amphorae from Ebusus Island and from de Greek orbital, as well as an unusual chronology of occupation between the beginning of the 4th century and middle 3rd century BC when they peacefully abandoned it, distinguish this settlement from any other Iberian settlements of this territory and even from other faraway regions.

The combination of all these elements leads us to think that it would be a colonial settlement of mixed population, more than likely a port-of-trade dedicated to all kind of commercial exchanges, inhabited by a mixed ethnic community of Mediterranean origin.

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COMMUNICATION UNEVEN: ACCEPTANCE OF AND RESISTANCE TO FOREIGN INFLUENCES IN THE CONNECTED ANCIENT MEDITERRANEAN

Theme: Mediterranean seascapes

Organisers: Vanzetti, Alessandro (Università di Roma "La Sapienza") - Driessen, Jan (Université catholique de Louvain)

Format: Regular session

Throughout history, the Mediterranean Sea was intertwined with human societies and their relations. Communication was globally enhanced as soon as coastal and island communities developed networks with each other, and emporia or hubs. The sea was crucial for leaps in the relational universe, with cultures getting in contact over wide distances, with different political and social structures. A first International Age emerged, peaking in the Late Bronze Age, during which people intensely moved and ideas, technology and objects spread. Through time, the Mediterranean Sea acted either as barrier or as facilitator of exchanges, contact, conflict and power, with warriors often changing into traders and vice versa.

The traditional excitement scholars experience over enhanced communication processes asks, however, for a proper analysis, as communication was never an even and pervasive given. Local communities made decisions as to which foreign objects adopt, adapt or reject, and how to react to connectivity. Bordering regions, but also proximate sites, sometimes show drastically different records of long distance contact. This agency and decision should be dependent on a variety of criteria: If processes of innovation and connectedness reflect the normal situation within a shared seascape, how can we explain the opposite?

The aim of this session is to measure acceptance of and resistance to outside influences within Mediterranean coastal settlements and their immediate hinterlands, with an open time range, but with a particular focus on the processes not reflecting simple commercial routes, but taking place at an intercultural level, in situations of developed connectedness.

ABSTRACTS

01 COMMUNICATION UNEVEN - AN INTRODUCTION TO THE TOPIC

Author(s): Driessen, Jan (Université catholique de Louvain) - Vanzetti, Alessandro (University of Rome „La Sapienza“)

Presentation Format: Oral

The history of the Mediterranean Sea is as much a web of interconnections as it is of interrupted or diverted communication. Indeed, communication was never an even and pervasive given.

This introductory presentation will discuss cases that can be interpreted as deliberate actions by the local communities as to which foreign objects adopt, adapt or reject, and how to react to developing intensification of contacts. One typical situation is represented by the drastically different records of long distance contact between bordering regions, or proximate sites.

Some cases can be seen as a consequence of social constraints, limiting the channelling of information and the free establishment of contacts. Other situations can derive from a straight sequence of contact-confrontation-reaction-repulsion, ending in the disruption of connections. Another further possibility is the conflict of trading networks, leading to a local dismissal of a circulated material. The more general point to be raised is whether we are facing a case of response to "dominant" or "imperialistic" attitudes, or whether the pattern is simply an outcome of alternative choice.

A main goal of the session is anyway to debate about the processes that can be defined as a resistance to a trait or behaviour which was becoming increasingly shared, and about the consequences of this resistant attitude.

02 TRANSFORMING THE LANDSCAPE: EVIDENCE FOR INCREASING GLOBALISATION IN THE TREMITHOS VALLEY (SOUTH-EAST CYPRUS) DURING THE SECOND MILLENNIUM BC

Author(s): Coenaerts, Jan - Samaes, Melissa - Nys, Karin (Vrije Universiteit Brussel; Maritime Cultures Archaeological Institute)

Presentation Format: Oral

On the transition from the Middle to the Late Bronze Age, the settlement pattern in the Tremithos river valley (south-east Cyprus) shows a swift and drastic transformation from a few, relative isolated pastoral villages to a town-based landscape with associated hinterland involved in international trade. The inhabitants of the river valley founded new sites (Hala Sultan Tekke, Klavdia, Kalokorio) at strategic interfaces in the landscape to facilitate trade and communication. The course of the Tremithos river from the cop-

per-rich Circumtroodos to the sea and its connection to one of the finest sheltered harbours on the island, i.e. the Larnaca salt lake (then a navigable lagoon), show the importance of the local topography. The transformation of the landscape was an intentional process of the valley's inhabitants in response to the Eastern Mediterranean demand for copper and trade opportunities. In this way, the Cypriot upper classes formed alliances with Eastern Mediterranean societies characterised by a multifaceted social hierarchy. The material culture in the Tremithos valley testifies of an adaptation of Levantine elite behaviour, visible in the increasing occurrence of imports (pottery, seals) and mortuary practices. Signs of an early involvement in international trade networks together with the evidence of extracting copper ore and crafting finished products, point to the regional autonomy of the Tremithos valley. The region's independent economic activities eventually lead to the emergence of social stratification and globalisation.

03 MINOANISATION AND MYCENAEANISATION THROUGH THE MORTUARY LENS

Author(s): Ichim, Cristina (University College London)

Presentation Format: Oral

The second millennium BC in the Aegean is marked by episodes of intensifying connectivity and the development of a differentially shared vocabulary of material culture and practices – often referred via the modern terms Minoanisation and Mycenaeanisation. This paper seeks to highlight the many advantages that funerary evidence has to offer in unpacking some of these complex processes of cultural affiliation. The funerary sphere presents a complex, contextually-rich dataset of cross-cutting variables – cemetery organisation, tomb form and architecture, burial assemblages, and wider burial practices – that permits us to trace past social interactions and in sufficient sample sizes to capture a sense of inter-regional, inter-settlement and even intra-settlement variability. As tombs were opened and accessible only for a restricted time, during the burial and funerary rituals, cultural transmission, particularly in terms of the internal configuration of the tomb, would only have occurred under specific social circumstances that suggest close social interaction. Equally important is the role of funerals in bringing together a large number of individuals from more dispersed social groupings, in fostering a sense of common belonging, and in redefining and restructuring the identities and social relationships between individuals and groups. A detailed analysis of tombs and burial assemblages across sites of the southern Aegean – focusing on Crete, Kythera and the Peloponnese from c. 1850-1350 BC – is shown to be effective in informing about social groups, human mobility, interaction, and the selective acceptance and rejection of cultural influences, that marked the processes of Minoanisation and Mycenaeanisation.

04 URBANIZATION IN THE MYCENAEAN CULTURE: FOREIGN INFLUENCES OR INDIGENOUS DEVELOPMENT?

Author(s): Zeman, Piotr (Adam Mickiewicz University in Poznan, Institute of Prehistory)

Presentation Format: Oral

Urbanization, as the social process can be defined in a systematic and relational way, in which it occurs within a closed system, and focuses on development of functional and structural differences between various settlements. Urbanization understood in this way undoubtedly took place in the Mycenaean culture, developing in the Aegean in the second millennium BC (ca. 1700 – 1050 BC), as it faced a gradual centralization of administration and economy around the palaces, which led to distinction of their role in the settlement network and development of lower towns. Palace together with the settlement surrounding it, creates an entity that can be called a palatial town, with internal structural, functional and social divisions and playing a key role in the regional settlement network. Within the broad study of contacts between the Aegean and Eastern Mediterranean in the Late Bronze Age it was not yet determined if the urbanization in the Mycenaean culture was directly influenced or even inspired by those relations. By analyzing data from five known and researched Mycenaean lower towns (Dimini, Thebes, Mycenae, Tiryns and Pylos) and comparing it with selected archaeological contexts in meso (Crete and Western Anatolia, where urban character of Mycenaeanised settlements results from their older origins - Minoan in case of Knossos and Anatolian in case of Miletus) and macro-scale (Hatti Empire, Syro-Palestine, Egypt, all in direct or indirect cultural and/or political contact with the Mycenaean citadels) the question stated in the title will be addressed. The presented project, aimed at creating models of Mycenaean lower towns and their entanglements, is at initial stage, thus only its goals and theoretical frameworks will be presented, together with summary of known archaeological and historical data and some preliminary thoughts on question of external influences in the process of formation of Mycenaean lower towns.

05 ABDERA, A TRADE AND CULTURAL NEXUS BETWEEN THE AEGEAN SEA AND THE THRACIAN HINTERLAND

Author(s): Georgiadis, Mercurios (Honorary Research Fellow at the University of Nottingham) - Garcia, Arnau (University of Cambridge) - Kefalidou, Eurydice (University of Athens) - Kallintzi, Constantina (Hellenic Ministry of Culture)

Presentation Format: Oral

One of the main aims of the Archaeological Project of Abdera and Xanthi (APAX) is the understanding of the relations between different cultural groups. The first colonisation episode at Abdera took place in the mid-7th century BC when colonists from Clazomenai in Asia Minor established a polis in coastal Thrace. One of the first activities at Abdera was the erection of a fortification wall for protection from the indigenous Thracian tribes, the conflict between them has been confirmed by texts of the Archaic period. A unique occurrence at Abdera is that there was a second colonisation episode with new colonists from Teos in coastal Asia Minor that took place in the mid-6th century BC. Despite the conflicts between the Greek colonists and the Thracian tribes for land, there was close

interaction between the two groups in cultural, economic and political level. The available information regarding the Thracians, their culture and the character of their interaction with the Greeks is known to a limited extent. APAX has shed more light for the first time on the character of the settlements, economy and the culture of the Thracians in a regional scale. Moreover, they allow a broader understanding of the diachronic relations between the Greek colonists and the indigenous Thracians. The success of Abdera as a colony is based on its economy and use of its large port in a regional trade that encompassed northern and eastern Aegean. The presence of a military ship-shed, the local production of amphora and the importation of numerous amphorae from the Aegean reveal the degree of exchanges through the sea. At the same time Abdera acted as a nexus of Thracian produce that reached this polis from the Thracian hinterland and were exchanged through its busy port to the broader Aegean.

06 ON THE BANKS OF THE TIBER: 'LOCAL' AND 'FOREIGN' AT OSTIA AND IN THE AGER PORTUENSIS IN THE REPUBLICAN TIMES

Author(s): Manzini, Ilaria (University of Amsterdam) - Olcese, Gloria („Sapienza“ Università di Roma)

Presentation Format: Oral

The mid- and late-Republican times are acknowledged as a phase of enhanced connectivity in the Mediterranean, partly as a consequence of the military and political expansion of Rome in Italy and beyond. Being the “port et porte” (harbour and gate) of Rome, Ostia and the surrounding territory are a privileged zone for the study of processes of import and export of goods between the Urbs and other areas, as attested by the main marker of such exchanges – namely, pottery. Until quite recently, however, fairly little was known on the characteristics of pottery assemblages dating to the Republican times from these sites. Within the framework of a multi-year collaboration between the University of Rome “Sapienza” and the Parco Archeologico di Ostia Antica, several contexts in the territory of Ostia and of the Ager Portuensis have been investigated, which have shed new light on the ceramics attested locally in a period ranging from the end of the 4th to the 1st century BC. Despite the close proximity of these sites on the two banks of the Tiber, the amphorae and pottery recovered show similarities but also differences, particularly in terms of the prevalence of (supposedly) local versus imported wares. In this paper, we will focus on three main classes – amphorae, black-glazed pottery and kitchen wares – to highlight such nuances, which might hint at different patterns in terms of openness to short- and long-range commercial exchanges.

07 ACCEPTANCE AND RESISTANCE: A COMPARISON OF LATE NEOLITHIC AND BRONZE AGE MALTA

Author(s): Vella Gregory, Isabelle (University of Cambridge) - Vella, Nicholas (University of Malta)

Presentation Format: Oral

The Maltese Late Neolithic and Bronze Age provide a new perspective on the ebbs and flows of network connectivity. The dominant narrative in Malta continuously refers to Sicily and Sicilian pottery as evidence for large-scale immigration. Recent research by Vella Gregory has challenged the Neolithic Sicilian narrative, and attribute studies of the pottery show that there were a variety of indigenous techniques. Bronze Age research by Vella has revealed a more nuanced picture.

The reasons for the Late Neolithic collapse remain unclear. Society appears to become more insular, temples are closed off and ritual practices become more restrictive. This is a time of conscious isolation as a consequence of internal influences and decisions. The end of the Neolithic is a culmination of 1100 years of building a distinct and close identity.

The Bronze Age re-opening of the Maltese Islands has been previously attributed to the arrival of new immigrants; here, the issue is also complicated. Petrographic analyses by David Tanasi and others have demonstrated the Sicilian origin of some of the pottery. There are also Greek imports via Sicily and Maltese pots in Sicilian sites. Settlements are found on dispersed hilltops and there is a complete change in visual culture, with pottery decorative techniques replicated on the ceramic.

We argue that multiple strands of material data are needed for a comprehensive re-examination with the LN-BA transition and its aftermath. Both periods have distinct patterns of connectivity, acceptance and resistance, and while the main discussion will focus on the Bronze Age, the antecedents played a far more crucial role than previously thought. Questions remain on the Islands' role in connectivity. The dominant narrative of the islands as a satellite of Sicily will be debated in light of a systematic review of the material culture and a maritory approach.

08 LATE BRONZE AGE RESISTANCE AND IRON AGE ACCEPTANCE OF MYCENAEAN INFLUENCES IN NORTHERN LEVANT: CHATAL HÖYÜK IN THE AMUQ (TURKEY)

Author(s): Pucci, Marina (Università degli studi di Firenze; Oriental Institute Chicago)

Presentation Format: Oral

Northern Levant experienced during the Late Bronze Age a large diffusion and appreciation of Mycenaean containers, which were traded in the eastern Mediterranean both for their content and/or for their appearance: painted containers, Mycenaean kraters in particular, became not only a luxury good in northern Levant but also a status symbol for specific social groups. By end of the Late Bronze Age, with the collapse of the eastern Mediterranean trading system and the political turmoil in northern Levant, a new phenomenon took place: local pottery production started to manufacture vessel which were Mycenaean in style and permeated the local repertoire at all social levels. This production did not mirror the same repertoire as the Late Bronze Age imported assemblage and involved also some eclecticism in using Mycenaean morphological features together with local elements, i.e. making a hybrid production. This paper presents the two different ways of acceptance and appreciation of Mycenaean products in the Late Bronze

Age II (1400-1160 BC) and in the Iron Age I (1160-900 BC) according to the material culture of a large village located 40 km east from the Orontes delta and from the harbors of Sabuniye and Al/Mina: it seems evident that while the Late Bronze Age appreciation of these products was strictly related to specific social classes and to specific trading routes, the Iron Age diffusion of this specific pottery reflects the presence of a community of migrants which settled in the Amuq and merged with the local population.

09 POTS AND POLITICS? EXPRESSING STATUS USING THE EXTERNAL AND THE LOCAL IN A SHIFTING SOCIO-ECONOMIC ENVIRONMENT

Author(s): Hale, Christopher (O.P. Jindal Global University)

Presentation Format: Oral

Recent analyses of Middle Helladic (MH) and Late Helladic I (LH I) pottery in central Greece (2050–1675 BCE) has significantly improved our understanding of pottery development (Hale 2014; 2015; 2016; Vitale et al. [in prep]). The likely pottery imports suggest that the latter MH period witnessed significant interaction with the islands of Kea and Aegina. These imports may have initially been part of a strategy to improve social status within central Greek communities by utilising pottery with connections to centres of power like Kolonna on Aegina and Ayia Irini on Kea. Clear central Greek elites who were expressing their status materially had emerged by LH I, evident in both settlement organisation and mortuary practices (Van de Moortel 2016).

Counter-intuitively, from MH III onwards, clear pottery imports almost disappear from the assemblage despite the increase in socio-economic complexity. Some examples of what might be interpreted as import substitution (locally produced imitations of Aeginetan aesthetics and morphologies in the near absence of genuine imports) suggest that Aeginetan-style pottery still carried some social capital at this time but was no longer easily available to emerging elites – perhaps reflective of a changing political and economic seascape in the south.

This necessitated a new strategy for social differentiation in early LH I. A re-orientation of central Greek pottery consumption which emphasised innovative and distinctly local aesthetics becomes evident, epitomised by the appearance of the highly specialised Boeotian Bichrome (or Mainland Polychrome) pottery. A parallel embrace of central Greek elite mortuary architecture instead of the Shaft Grave constructions of Aegina and the Argolid suggest that a distinct central Greek LH I elite identity had emerged. While initially catalysed through external interaction with the south, early LH I central Greek social capital was ultimately expressed and negotiated through the consumption of predominantly local material culture.

10 SOUTHERN ITALY IN THE LBA MEDITERRANEAN NETWORK: ADOPTION AND RESISTANCE.

Author(s): Vanzetti, Alessandro (Università di Roma "La Sapienza") - Castagna, Maria Antonietta (University of Rome "La Sapienza" - collaborator) - Di Renzoni, Andrea (National Research Center (CNR - ISMA)) - Marino, Sara (University of Rome "La Sapienza")

Presentation Format: Oral

Southern Italy (and Sicily) have been repeatedly quoted as cases of straight involvement in the Western extension of the LBA Mediterranean Network. Annamaria Bietti Sestieri has instead developed a model of impact-confrontation-rejection for the situation of the Aeolian islands and Sicily, that remained rather isolated in the literature.

Indeed, the impact of increased contact between the Central and the Eastern Mediterranean gave origin to a wide variety of situations, including rather peculiar differences between LBA Southern Italian regions, in the intensity of material interaction, but also differences between sites lying close-by.

It is likely that the described uneven pattern of contacts and communication is the result of both differences in the seafarers' political and economic interests and in the inner power structure proper to the Southern Italian communities.

The central/southern Gulf of Taranto, and its extension up to Crotona, largely corresponding to the territory traditionally referred to as Oinotrian, is one of the most relevant central Mediterranean areas involved in the LBA network.

From Taranto to Crotona, a peculiar interaction zone can be defined, where the local production of the Italo-Mycenaean ware, of the fine paste pithoi of the Aegean-derivative class and of the wheel-thrown grey ware is particularly well established.

By comparing the data recently extracted through excavation and analysis from the renown hilltop site of Broglio di Trebisacce and other contexts in the Gulf of Taranto, it is possible to focus on a specific and illuminating case-study for i) the identification of directional contacts, where specific sites in Oinotria and in the Aegean were respective preferential terminals and ii) the role of inner Oinotrian political structures in directing communication.

11 JASON, HERACLES, JONAH, SOME KÉTÉ AND THE WINE RED SEA.

Interwoven iconographies of resurrection in the Iron Age Mediterranean.

Author(s): Nebelsick, Louis D. (Cardinal Stefan Wyszyński University)

Presentation Format: Oral

This essay on the Pan-Mediterranean iconographies of resurrection during first millennium BC is based on the exegesis of a small relief on the base of an early 5th century Etruscan simpulum handle from the ostentatious mid 5th century BC Bolognese woman's burial, the Tomba Grande de Girardini Margherita. It shows the image of a nude youth with a sheep's fleece in hand leaping out of a monstrous bearded snake's mouth. Initially the interpretation of this motif follows its traditional interpretation as Jason escaping

from the mouth of the monstrous Colchian serpent/dragon. Yet certain iconographic details invite the beholder to consider a wide palate of mythological celebrations of heroic resurrection and rejuvenation as well as to examine the context of story telling and trans-Mediterranean cultural communication embedded in the symposium. These narratives include Perseus and Herakles rescuing princesses from voracious sea monsters but also the all time favorite story nautical peril: Jonah and the Whale.

Finally the funerary context of this imagery of resurrection is considered. Nautical and maritime imagery in Etruscan graves can be traced back to the beginning of the Iron Age and remain a leitmotif of Etruscan funerary iconography into the Hellenistic period. Yet interestingly it is by no means an exclusive imagery as competing visions of the deceased's post mortal destiny are often found with in the same grave contexts. This is a polysemous/ambiguous approach to the question of overcoming death which is so characteristic of Mediterranean antiquity.

12 A SHARED MEDITERRANEAN? SOME OBSERVATIONS ON AN ARCHAEOLOGY OF RESISTANCE

Author(s): Driessen, Jan (Université catholique de Louvain)

Presentation Format: Oral

Throughout history and starting from the Late Palaeolithic period, the Mediterranean has been intertwined with human societies and their relations. Coastal and island communities developed networks with each other, with some gradually being promoted as emporia or hubs where goods and services were collected and distributed throughout the networks. At all times, however, there have been communities that, despite being located on trade routes, resisted innovations and did not receive imports. In *The Art of not being governed*, J.C. Scott discussed societies that willingly and reactively remain outside nation states, explaining marginality as a consequence of remaining free from state-building neighbours. A similar political stance is present in modern resistance studies but comprises observations that are useful in showing how material culture is actively used. In the pre-Hellenistic Mediterranean, however, there are few signs that imperialistic political and military threats could have affected the resistance to new technological inventions. There rather seem to be instances of boundary maintenance (cf. F. Barth), the construction of social confines that allow groups to maintain their identity when members interact with others. This not only demands the creation of group membership criteria and ways of signalling these but also indicates a conscious structuring of interactions. In addition, this often takes the form of purposeful or imposed choices made through material culture. Boundary maintenance reinforces a group's unity and distinctness by emphasizing traits that set its members apart from others. Examples of such studies are still relatively scarce but in my paper, using examples from the Bronze Age Aegean, I will apply the concept of cultural resistance to explain anomalous diffusion patterns of material culture and argue that through such resistance, material culture was used to help shaping and maintaining boundaries and hence community identity.

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THE SELF-ORGANIZATION OF ARCHAEOLOGISTS IN EUROPE: ROLES AND NEEDS, RESPONSIBILITIES AND LEGITIMACY

Theme: Archaeology and the European Year of Cultural Heritage

Organisers: Scherzler, Diane (Deutsche Gesellschaft für Ur- und Frühgeschichte - DGUF) - Siegmund, Frank (University of Münster) - Belford, Paul (Chartered Institute for Archaeologists - CIfA; Clwyd-Powys Archaeological Trust)

Format: Other - combination of discussion session and workshop

In most if not all European countries archaeology finds itself under growing pressure. It is facing financial cuts and legislative changes which are setting priorities other than caring for cultural heritage. State archaeologists struggle to fulfil their duties under increasing pressure from political and economic factors in new developments. There is no universal agreement on archaeological professionalism or working conditions, and even where there is agreement not everyone follows the rules. Efficient lobbying and communication with politicians and citizens is more important than ever – but opportunities are often missed, due to archaeologists' many obligations and duties, and perhaps also due to unclear roles. This session seeks to discuss these and other areas which archaeologists engage, examining the existing roles and functions within the field: e. g. state archaeologies, NGOs, professional associations, and learned societies. We will discuss what archaeologists can do to strengthen their inner structure and their efficiency. How many of our very limited resources are being used to protect allegedly own terrains within archaeology instead of dealing in a well-planned and harmonized way with external pressures? How common is a silo mentality, where a highly specialised discipline is fragmented and unable (or unwilling) to look at the bigger picture? Which fields are not covered enough, where could overlapping work and repeatedly "inventing the wheel" be reduced? This session wants to initiate a reflection of the future needs of our self-organization, and a debate on "who does what". This discussion session will consist of presentations and world cafés. The session will also include discussions about the EAA Committee on Professional Associations in Archaeology (CPAA), and all members interested in that committee are invited to engage.

01 INTRODUCTION TO THE SESSION

Author(s): Scherzler, Diane (Deutsche Gesellschaft für Ur- und Frühgeschichte e. V.) - Sigmund, Frank (University of Münster)

Presentation Format: Oral

Our session serves as a self-reflection, bringing together the perspectives and experiences of colleagues working in different areas of the "system archaeology". We wish to think collectively about the self-organization of archeology in Europe. Presumably, every archeologist has personal experience and a perspective that is strongly influenced by the environment he or she comes from and the scope in which he or she works. There is nothing wrong with that, of course: our experiences are valuable and make us strong. At the same time, however, it is also true that being embedded in established structures and traditions sometimes obscures the view of needs, opportunities and options for the future. These are even more important in a time when archeology is struggling with economic difficulties and problematic framework conditions, i. e. when it is very important to use competencies and limited resources wisely. What tasks exist, what roles are needed to jointly create an effective and well-legitimated self-organization of archeology resp. to get it? Last but not least: what do non-archaeologists expect from us? Only from this perspective does it make sense, we argue, to have a close look on existing structures and to examine where something new is to be built up for a cleverly integrated whole and where existing bodies/structures should definitely be strengthened.

02 WHAT ROLE CAN WORLD ARCHAEOLOGICAL ORGANIZATIONS PLAY IN THE CONDITION OF GLOBALIZATION AND FRAGMENTATION

Author(s): Mizoguchi, Koji (Kyushu University)

Presentation Format: Oral

This contribution argues that world archaeological organizations such as WAC can play a significant role as an arena for continued discourse in which both the clash of interests/different epistemic-ontological stances and cordiality as an absolute rule for being there are taken for granted. It is a truism to say, in the current condition of globalization and the proliferation of fragmentation in self-identification and epistemic-ontological frameworks, that everything archaeological is the subject of negotiation between stakeholders. That perception/increasingly shared recognition leads to the increased emphasis on managerialism in archaeological discourse on one hand and the avoidance of epistemically-ontologically informed dialogue as to how we can do archaeologies better. However, it is clear from our daily experiences that we have to tackle pressing contemporary issues with archaeological implications such as abusive utilizations of heritage for various harmful/discriminately causes in ethically and theoretically-informed manners. In that regard, we have to maintain and, if necessary, consciously create an arena in which epistemic-ontological disputes are not only tolerated but also encouraged without the fear of backlash. For that purpose, world archaeological organizations such as WAC and EAA can play a significant role because such organizations are "meant to be" highly inclusive and have established their shared images to be politically conscious and active. Some concrete examples of personal positive experiences that support the argument will be shared.

03 CRASH COURSE: FIVE STEPS TO UNDERSTANDING EUROPE WHAT CAN THE ARCHAEOLOGICAL COMMUNITY DO TO BE MORE INFLUENTIAL?

Author(s): de Wit, Leonard (Europe)

Presentation Format: Oral

It's not easy to keep up with developments within Europe right now. As relatively small archaeological sector it's difficult to get on grip on things, and see and understand what opportunities are appearing before us. It might be tempting, and even understandable, to just lay back, feel overwhelmed and grumpy and see what happens.

For those who don't want to give in to this temptation this crash course might be interesting. In five steps you will be brought to more understanding. The lecture will start off with a short overview of interesting developments within the Council of Europe and the European Union and speculate on possible outcomes of the European Year of Cultural Heritage. Next I will make an analysis on the relevance of these developments for the archaeological heritage community. What opportunities do we see? What strategies do we need? And - most important - what possible actions can we undertake? The leitmotiv for answering these questions is the need to position ourselves within framework of cultural heritage as a whole. More and more cultural heritage is seen as an important asset for society and international cooperation. It's sensible for the archaeological community to piggyback on this movement.

Focus will be given on the activities and position of Europae Archaeologiae Consilium (EAC), and the so-called Amersfoort Agenda. As an organisation of governmental organisations, EAC has a special position. Although archaeologists often expect otherwise, EAC cannot engage in advocacy activities. But we can be very effective, playing a role between national governments, international institutions and non-governmental organisations like EAA.

04 LISTEN TO ME: LOBBYING FOR ARCHAEOLOGY

Author(s): Aitchison, Kenneth (Landward Research Ltd)

Presentation Format: Oral

Who are the archaeologists that think they have influence over politicians?

Do other archaeologists agree that these are the most influential people, and that these are the most appropriate individuals to be the sector's "influencers"? When it comes to archaeology, what do politicians think is important? (and remember – a politician thinking archaeology is 'interesting' is not the same as them thinking it is 'important'). The answers to these questions vary from country to country, and are not the same at the European level as they are at national, regional or local levels. The politicians need something they can sell to the voters that will re-elect them, not something that cannot be balanced against all of society's other concerns. And this is often forgotten by archaeologists, who might fall into the trap of focussing on the technicalities of past human lives, rather than the ongoing needs of those in the present and future. Does this all mean that archaeology is lost in an introspective maze, or are there ways to make a difference to political decisions?

This paper will review the different methodological approaches used to try to get politicians' attention – from open 'letters' in the world of social media, to public campaigns, to direct, technical and face-to-face lobbying – thinking about how valuable or effective these approaches are or are not. And it will review the roles that can be played by different "actors on the stage" – by looking at the professional roles in archaeology that politicians think are important, it will think about differences between the ways that professional archaeology has been structured by the wider cultural norms across Europe and why this then affects the potential for different groups to influence political decision making – and how valuable or effective these groups' interventions might be.

05 CAN CULTURAL HERITAGE WORKERS AND PROFESSIONALS OCCUPY THE MIDDLE OF POLITICAL AND SOCIAL DEBATE? THE "MI RICONOSCI" EXPERIENCE IN ITALY

Author(s): Bison, Leonardo (University of Bristol) - Tomei, Francesca (Independent researcher) - Massimino, Martina (University of Durham) - Utzeri, Flavio Domiziano (Alma Mater Studiorum - Università di Bologna) - Lunardon, Ester (Independent researcher)

Presentation Format: Oral

Across Europe, those employed in the Cultural Heritage sector are experiencing similar issues: underpayment, marginalization from the political debate, lack of professional consciousness, importance of familiar and economic background to be able to reach relevant professional positions. In Italy, archaeologists are a partial exception, having a far stronger working consciousness compared with other professional categories such as Historians of Art or Conservation Scientists, thanks to the work of some professional associations founded in the 1990s. Nevertheless, their working conditions remain unstable and they are marginalized from the political debate, due to their small number.

Since 2015, a student and young professional-led movement called "Mi Riconosci?" (do you recognize me?) has been trying to push those engaged with the Cultural Heritage in Italy to fight together for the same issues, overcoming professional differences. Common causes include the elimination of free and underpaid work; new laws to better regulate each profession; bigger and better investments on Cultural Heritage conservation and management; multiplication of public working positions.

The movement had an impressive impact in the first months of its activity, receiving national media coverage about working conditions in the field of Cultural Heritage. This movement continues to grow in numbers and impact, and has forced politicians to address these issues directly, slowly creating a stronger, allied working consciousness in marginalized professional categories. This talk presents the aims and results of Mi Riconosci to date as an example of how the marginalisation of Cultural Heritage workers can be overcome successfully.

06 SCOTLAND'S ARCHAEOLOGY STRATEGY: REFLECTING ON OUR PROGRESS SO FAR

Author(s): Owen, Kirsty - Jones, Rebecca (Historic Environment Scotland)

Presentation Format: Oral

Scotland's Archaeology Strategy was developed following public consultation in 2015. Taking its lead from *Our Place in Time*, Scotland's first ever strategy for the historic environment, and *Going Further: The National Strategy for Scotland's Museums and Galleries*, it brings together key organisations within the sector to agree a direction for archaeology in Scotland over the next 10 years. Our intention was to agree what needed to change in order to improve archaeological practice in Scotland and to work together to achieve this; including promoting professionalism, sharing of resources, better communication, embedded archaeological education and advocating skill building and innovation throughout the sector. Historic Environment Scotland is partnered with The Society of Antiquaries of Scotland, ALGAO Scotland, National Museums of Scotland, Archaeology Scotland and ClFA in the delivery of the Strategy, and in 2016 we agreed the first iteration of a delivery plan which is now being implemented through collaborations and partnerships.

In this paper I will reflect on our progress to date and the issues which we have encountered. Better communication between different areas of archaeological practice is key to the delivery of the Strategy, as is acknowledging the multifaceted nature of the discipline and under-representation of some interests at a national level. However, translating the commendable aims of a high-level document into realistic deliverables which can be resourced and are sustainable is challenging, as is dealing with the fragile bunker mentality which can exist in some areas, and managing expectations.

07 THE REGISTER OF PROFESSIONAL ARCHAEOLOGISTS AND ARCHAEOLOGICAL SOCIETIES IN THE UNITED STATES: PARTNERS IN ADVANCING PROFESSIONALISM AND PROTECTING ARCHAEOLOGICAL HERITAGE

Author(s): Altschul, Jeff - Klein, Terry (SRI Foundation)

Presentation Format: Oral

In 1998, the Society for American Archaeology (SAA), the Society for Historical Archaeology (SHA), the American Anthropological Association (AAA), and the Archaeological Institute of America (AIA) came together to create and financially support the Register of Professional Archaeologists (the Register). The purpose of the Register is to establish and enforce a Code of Conduct and Standards of Research Performance. The sponsoring societies each had their own ethical statements, yet found themselves powerless to impose their ethical standards since they had no legally enforceable grievance procedure. Hence, the Register was established as a voluntary list of archaeologist meeting professional qualifications who agree to adhere to the Register's codes and standards. Today, there are over 3,000 Registered Professional Archaeologists. The four sponsoring societies limit the role of the Register to the narrow, but vital, domain of professional conduct. The Register does not advocate for public policy outside this area. Actions to protect the archaeological record and cultural heritage laws in the United States are pursued individually and jointly by the four sponsoring societies. This presentation discusses why the Register is vital to the interests of the SAA, SHA, AAA, and AIA in promoting archaeological professionalism and ethics. We will also discuss how these societies are working in partnership and combining their resources to protect American archaeology from ever-increasing attacks by the U.S. Congress and Trump administration.

08 CIFA STANDARDS AND GUIDANCE: FIT FOR PURPOSE IN A CHANGING WORLD?

Author(s): Geary, Kate (Chartered Institute for Archaeologists)

Presentation Format: Oral

The Chartered Institute for Archaeologists (Cifa) is the leading professional body for archaeologists in the UK and overseas. As well as setting and monitoring compliance with an ethical code, Cifa sets Standards covering a wide range of professional practice and issues guidance to its members on how the Standards may be met. Cifa Standards and guidance define good practice, expanding and explaining general definitions in the Code of conduct and are formulated in consultation with the sector. They are used by archaeologists commissioning or designing archaeological work in order to define measurable quality standards. Compliance with the Standards is a professional obligation for Cifa members and for its Registered Organisations.

Despite a growing (and increasingly structured) non-UK membership, the roots of these Standards are still firmly embedded in UK professional practice, and this presents us with a challenge. Even within the UK, archaeological policy and practice across England, Scotland, Wales and Northern Ireland is diverging resulting in the need, potentially, for a single Standard to be supported by guidance tailored to the specific national policy framework. For our members across Europe (and the rest of the world), that need is even greater. So how do we go about setting Standards that aren't tied to national structures? Is there a danger that in seeking international consensus we end up with statements that are so high level and generic as to be meaningless and, worse, useless in terms of a quality standard?

Cifa is planning a thorough review of its Standards and guidance in 2018-19 and will be asking exactly these questions. This contribution to the round table discussion will update EAA members on progress so far and seek their advice on potential ways forward.

09 REDEFINING ROLES – SHARING RESPONSIBILITY: THE EAA IN THE EUROPEAN HERITAGE ALLIANCE 3.3

Author(s): Hueglin, Sophie (European Association of Archaeologists; Newcastle University; Foundation Pro Monastery St John, Muestair) - Potrebica, Hrvoje (Institute for Archaeology, Zagreb)

Presentation Format: Oral

In the last 25 years the European Association of Archaeologists (EAA) has become both: with its Annual Meeting the major platform in Europe for archaeologists to present their projects, products and plans as well as a political protagonist as recognised International Non-Governmental Organisation (INGO) with the Council of Europe. In 2018, the European Year of Cultural Heritage (EYCH), the EAA forms together with more than 40 European or international networks and organisations the European Heritage Alliance 3.3. This is an informal European sectoral platform in the wider field of cultural heritage organised by Europa Nostra. The EYCH is a unique possibility to form partnerships between these organisations and to build a longterm legacy.

To form new alliances EAA is rethinking its role and responsibilities among other organisations, but also more general the role of archaeology and archaeologists in heritage management and civil society:

- from governance to empowerment
- from representation to responsibility
- from nature and culture to landscape and environment

Empowerment and responsibility is at the heart of what is laid out in EAA's Framework for Strategic Development 2016 – 2021. This move from passive participation and representation to active engagement and potency, requires a change in attitude not only from the ones elected to lead the organisation, but also from each individual member. At the same time, the original scope of EAA is challenged because archaeology as a subject, but also in its institutions is about to bridge the nature-culture divide and embrace a

10 PROFESSIONAL ASSOCIATIONS AND INTERNATIONAL COOPERATION: THE BIRTH OF ClfA DEUTSCHLAND

Author(s): Hinton, Peter (Chartered Institute for Archaeologists) - Schauer, Michaela (ClfA Deutschland)

Presentation Format: Oral

This paper will begin with a comment on international cooperation between professional associations in archaeology, and will look in more detail at the models the Chartered Institute for Archaeologists (ClfA) has developed for working with others (PH). It will then describe the formation of ClfA Deutschland – formally launched in February 2018: it will explore the aims and planned activities of ClfA Deutschland, and will discuss its relationship with ClfA's governance structure (MS). By reviewing the advantages and challenges of this arrangement, the speakers intend to stimulate debate about this model – or alternatives – for international cooperation over professional regulation.

ClfA is the leading professional body representing archaeologists working in the UK and overseas. We promote high professional standards and strong ethics in archaeological practice, to maximise the benefits that archaeologists bring to society. We are the authoritative and effective voice for archaeologists, bringing recognition and respect to our profession.

- Archaeology adds value to industry and to society
 - ClfA champions professionalism in archaeology by setting standards, measuring compliance, promoting best practice and sharing knowledge
 - Members of ClfA are accredited and skilled in the study and care of the historic environment
 - Accreditation in archaeology recognises the professionalism of practitioners, improves their careers and attracts new people into archaeology
 - Using accredited archaeologists assures clients that the work will meet their needs and the needs of the public
- ClfA is delighted that archaeologists in Germany have bought into these values and formed ClfA Deutschland

11 PROFESSIONAL ASSOCIATIONISM IN ARCHAEOLOGY. BETWEEN SPECIALIZATION AND COLLECTIVE COHESION

Author(s): Pastor Batalla, Isidre (Associació d'Arqueòlegs de Catalunya)

Presentation Format: Oral

The exercise of archaeology as a profession requires an associative framework connecting members of the professional body and representing and defending their interests. In recent decades the development experienced in archaeology has favoured the emergence of a large range of associations focusing on specific fields within the profession. This diversity is, a priori, a positive outcome of the dynamic restructuring of the discipline and, as such, it should be encouraged. It responds to specific needs derived from differentiated territories, specializations and specific professional practices. While positive, the diversification of associations may also lead to a lack of communication within the different sectors. In this paper we will propose that archaeologists must ensure that their cohesion as a professional group is maintained, for this can only enable them to fulfil their main scientific, heritage and social roles. The connection between the different sectors will only be possible if mechanisms are created that facilitate and, at the same time, speed up communication between the broad and diversified mosaic of entities currently existing in each region, country and even throughout the continent. Dialogue and cooperation between all these associative groups should be the true essence of the collective identity of the archaeological profession.

12 PROFESSIONALISATION IN A TIME OF UNCERTAIN ECONOMIES AND POLITICS: THE EAA'S COMMITTEE ON PROFESSIONAL ASSOCIATIONS IN ARCHAEOLOGY

Author(s): Wait, Gerald (Triskelion Heritage)

Presentation Format: Oral

There are many approaches to the official management of archaeology and cultural heritage across the world. These tend to be situated on a spectrum between total state control (the 'national patrimony' model) and the regulation of private actors (the 'social licence' model). Whichever model – or combination of models – is used, the success of any archaeological or cultural heritage programme depends on adequate resources, community and stakeholder engagement, and strong regulation and oversight. It is also essential that the archaeologists or other heritage practitioners have the necessary skills and operate in a professional framework which is independent of political or financial structures. This introduction considers what such a professional framework should look like, and how it should be managed. We will consider how an independent professional framework can achieve recognition from government and private-sector archaeology and cultural heritage practitioners at all levels, and how such a framework can retain the respect of politicians, developers and other professions whose work impacts on archaeology and cultural heritage. This paper will set the scene and provoke a lively discussion.

13 GENERAL DEBATE ABOUT THE SELF-ORGANIZATION OF ARCHAEOLOGISTS IN EUROPE

Author(s): Siegmund, Frank (WWU Münster; DGUF) - Belford, Paul (ClfA) - Scherzler, Diane (DGUF)

Presentation Format: Oral

After the presentations in this session, a structured one-hour debate ("world café") will be the final part of this session. Together with all presenters and participants we want to try to get a fresh look at the topic - a look that is based on the needs and also on the conditions that exist outside and inside archeology. What are the organizational needs of a modern, strong and successful European archeology? The questions and the topics of the final debate are determined jointly by the audience at the beginning of it. It is intended not to end in the approximate, but to close the session with collective results and theses. The debate will be moderated by Paul Belford, Diane Scherzler and Frank Siegmund.

385 MOVING FORWARD THROUGH A NEW GENDERED FUNERARY ARCHAEOLOGY. CURRENT RESEARCH AND NEW PERSPECTIVES ON DIFFERENCES AND INEQUALITY IN PREHISTORIC SOCIETIES

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Carracedo Recasens, Robert (Universitat Autònoma de Barcelona, Departament de Prehistòria) - Cintas Peña, Marta (Universidad de Sevilla, Departamento de Prehistoria y Arqueología) - Duboscq, Stéphanie (Freelance Archaeologist)

Format: Regular session

In recent decades the study of women and children in archaeology has expanded significantly, altering our vision of prehistoric societies in a decisive way. The image we have today of people in the past is more detailed, complex and accurate than it was at the end of the twentieth century. This transformation owes much to the development and application of new techniques, as well as to newly-emergent and innovative theoretical approaches which focus on questions of: gender; identity; bodies; diversity, and inequality.

Yet many questions are still left unanswered: what aspects of material culture are most suited to research on gender and age in prehistory? Do concepts like horizontal versus vertical hierarchy help us understand matters of difference and inequality in prehistory? Are there artifacts we can designate as markers of gender or age? How can we link the archaeological record to social categories; to their features and roles within society?

We propose a session to discuss these and other topics related to the archaeological funerary record. We welcome particular or general cases studies on prehistoric societies along with ethnographic research pointing to new areas of study and contributing to debate. We invite contributions from diverse theoretical approaches to create a fruitful and vibrant discussion in the session.

ABSTRACTS

01 CAN WE TALK ABOUT PRESTIGE IN ARCHAEOLOGICAL HUNTER-GATHERER-FISHER SOCIETIES?

Author(s): Pedraza, Diego (I.M.F. - C.S.I.C.)

Presentation Format: Oral

Traditionally, archaeology and anthropology proposed a vision of HGFS that was simple and egalitarian as opposed to complex societies, which were unequal or in evolutionary transition towards inequality. Since the last decades of the 20th century, this vision has changed to consider the existence of egalitarian, transegalitarian or unequal HGFS. Thus, some paraphernalia of the funerary record, in the Late Pleistocene, has been interpreted in terms of possible markers of inequality, with some objects categorized as "prestige items", and associated with men, women and even children.

The term "prestige" appears frequently in archaeology, however, it is used ambiguously and very few scholars define it or refer to another definition. It is generally understood that it refers to the existence of social inequalities and is associated with social status, power and wealth differences. Its presence always seems to be related to things or archaeological complexes beyond what is normally considered or common, and without a univocal meaning.

Starting with some archaeological examples, we propose in this contribution to review the concept of prestige and discuss the theoretical and methodological problems associated with this category that allows us to unambiguously identify its presence in the record. From our perspective, prestige is a social production which serves as an instrument for the maintenance and continuity of society. As such, it would be the marker that indicates and legitimizes the social position of subjects (women, men and / or children) in the social framework.

02 THE “PRE-GLASS CEILING”: MAY THE MESOLITHIC WOMAN FROM AIZPEA (NAVARRRE, NORTHERN IBERIA) REPRESENT AN EARLY CASE OF SEX-RELATED INEQUALITY?

Author(s): Hervella, Montse (UPV/EHU) - Fernandez-Crespo, Teresa (School of Archaeology, University of Oxford) - Ventades, Nerea G (UPV/EHU) - Schulting, Rick (School of Archaeology, University of Oxford) - de la Rua, Concepcion (UPV/EHU)

Presentation Format: Oral

It has been assumed that gender asymmetry in prehistoric time moves from unelaborated differences between males and females at the beginnings of the Neolithic to publicly expressed distinctions in the Copper and Bronze Ages. However, there is increasing evidence that some Mesolithic societies had an important degree of inequality, which –among other aspects– might have included differential access to some food resources among certain population groups. In this scenario, it is possible that sex had played a role. Here, we present anthropological, isotopic and molecular (mitogenome) data from a Late Mesolithic woman found in Aizpea rockshelter (Navarre, northern Iberia). Carbon and nitrogen stable isotope results on bone collagen suggest a limited protein intake (e.g. meat from wild ungulates). This is consistent with the data provided by trace elements, oral pathology and phytolith analysis on dental calculus, which suggest a high dependence on plant resources. While the mitogenome of Aizpea’s woman shares some mutations with other Cantabrian mitochondrial lineages, it has not been found in any other past or present populations. This may be attributed to low fertility, despite Aizpea’s woman showing skeletal evidence of pregnancy and/or parturition. The available data, discussed in the context of other northern Spanish Mesolithic burials (particularly, those from La Braña in Castile and León and Chan do Lindeiro in Galicia), suggest that Aizpea may represent a case of gender being a criteria for community differentiation among late hunter-gatherer societies.

03 GENDER AND AGE IN WESTERN EUROPEAN UPPER PALAEOLITHIC TO NEOLITHIC BURIAL PRACTICES

Author(s): Harto Villén, Ana (University of York)

Presentation Format: Oral

The study of gender and childhood in the past was born as a revindication of the importance of the roles developed by women and children in society, since they had been traditionally ignored by the archaeological discipline, and over the past few decades, it has attracted increasing interest. The most direct way of approaching these subjects is through the funerary record, since it offers direct access to the individuals. This paper will offer preliminary results from an ongoing research project that examines the Upper Palaeolithic to Early Neolithic Mortuary record from Western European countries, including Portugal, Spain and France. This study constitutes an ambitious attempt to assemble the funerary data from these countries in order to get a better understanding of Upper Palaeolithic to Early Neolithic societies. It focuses on how the sex and age of the individuals relates to biological issues (stress markers and pathologies) and to the different ritual characteristics of the burials (the presence of a grave and/or a sepulchral structure, if the burial was isolated or was part of a bigger compound of burials, the position and orientation of the body, the presence of colorant and fire, the presence and kinds of grave goods...), as well as the possible explanations for those relations.

04 GENDER AND RITUAL DURING THE PRE-POTTERY NEOLITHIC

Author(s): Erdem, Deniz (METU)

Presentation Format: Oral

The beginning of the 10th millenia BC, starting with the climatic changes in various regions of the Near East the hunter-gatherer lifestyle has begun to leave its place to permanent settlements. One of the most important developments in the Near East during this process, is of course the changes in spatial strategies. However, with the domestication of plants and animals, a new economic and social structure was also emerged. This new structure should have caused domestic inequality in the first place. The core of the social inequality must have manifested itself in household age and sex-based differentiation. The ritual has played an important role in legitimizing this new social order. For this reason, it can be considered that the rituals and the items used during the ritual bear significant clues about the social roles, which would enable us to understand the distribution of gender roles through analysis of the rituals. In this study, gender roles will be understood with the help of analyses carried out on the burial rituals, grave goods and the other items used during the rituals in the societies lived in South East Anatolia and Levant region during Pre-Pottery Neolithic Period. And it is sought after whether these rituals can be parameters to understand social organization of a concerned area in a given time period.

05 GENDER, STATUS AND IDENTITY IN LATE JOMON FUNERARY EVIDENCE

Author(s): Bausch, Ilona (Sainsbury Institute for Japanese Arts and Cultures)

Presentation Format: Oral

This paper addresses issues of gender and status-based identity among the prehistoric ‘complex foragers’ of the Jomon culture in the Japanese archipelago, particularly during the Late and Final stages in Northern Japan (c. 1500-300BCE). Jomon foragers are characterized by a rich material culture, including elaborate ceramics, ritual artefacts, lacquer-ware, polished stone tools and jadeite ornaments.

From the Late Jomon onwards, cemeteries and ritual spaces became separated from settlements and everyday-life contexts, and arguably, the social system developed from egalitarian to (some) social differentiation. More grave goods, particularly well-crafted

personal ornaments, are found with less people, sometimes including young children. In addition to necklaces incorporating jadeite, amber or steatite beads, personal ornaments were made of a wide range of materials: organic, stone and ceramic. Organic materials including human remains are occasionally found well-preserved in certain contexts, such as shell middens and water-logged sites.

Based on such data, Japanese archaeologists have devised methodologies to distinguish social affiliation, gender and status: dental mutilation patterns for kinship affiliation and age-based rites of passage; certain categories of grave goods are seen as inexorably linked to gender and status. For example, polished stone axes, arrowheads, phallic stone objects and carved decorated antler objects are regarded as masculine (the latter signifying 'leadership'), while personal adornments such as red-lacquered ornaments, hair combs, bracelets and ear ornaments are considered exclusively feminine (combined attributes indicating 'shamans'). As we shall see, there are some parallels with Northern European Mesolithic cemeteries and their interpretations.

However, evaluating some case studies (such as Karimba in Hokkaido), this paper argues that traditional Japanese interpretations are overly binary in their interpretations on gendering grave goods; exceptions are not taken into account. Moreover the possibility of a third gender—the existence of which is well-documented in ethnographic sources—has been completely overlooked.

06 YOU'RE NOT OLD ENOUGH: FUNERARY TREATMENT TOWARDS CHILDREN DURING THE RECENT PREHISTORY (IIIIRD- IIND MILLENNIUM CAL BC) OF CENTRAL SPAIN

Author(s): Herrero-Corral, Ana (Universidad Complutense de Madrid)

Presentation Format: Oral

Nowadays every attempt to reconstruct any past society, must avoid excluding any age/sex group, in order to get a complete picture of the whole structure and organization of those populations. However, up until a few decades ago children were deliberately set apart from these studies, thought to be useless and passive members of the community. This paper deals with the information that can be drawn about the societies of the IIIrd and IInd millennium cal BC by the analysis of children graves from different sites in central Iberia (middle Tagus Basin). Special attention will be paid to the funerary treatment and the grave goods, which not only are crucial tools for understanding the social role of children within their communities but also generate several debates on different crucial topics such as gender differences or the inheritance of the status. Some of the questions to be solved are: is the funerary treatment (position, structure, tomb companions, etc.) related to age categories? Would only older children have access to some "exclusive" grave goods? In this sense, the Bell Beaker period is one of the best scenarios to test these questions, comparing tombs with or without these type of items and their distribution in the different age categories.

07 WE ARE ALL ONE: COMMINGLED HUMAN REMAINS AND FUNERARY PRACTICES AT THE PERDIGÕES DITCHED ENCLOSURE (PORTUGAL), 3RD MILLENNIUM BC

Author(s): Evangelista, LS (Era Arqueologia, S.A.; ICArEHB - Interdisciplinary Center for Archaeology and Evolution of Human Behaviour, Algarve University; CIAS - Research Centre for Anthropology and Health, Coimbra University)

Presentation Format: Oral

The Perdigões 16ha ditched prehistoric enclosure (Reguengos de Monsaraz, Portugal) has been continuously investigated since 1997 and thoroughly published. It was a long duration site, beginning in the end of the Middle Neolithic and reaching the transition to the Bronze Age (3500-2000 BC).

Throughout the last 20 years, several funerary structures have been unearthed, showing a surprising variety of mortuary practices, which include mainly secondary depositions of fragmented human bones and cremains in different architectural structures like tombs, pits or ditches, found alongside a great variety and number of votive artefacts and animal remains. Despite their high level of fragmentation, anthropological studies of the recovered human remains have provided important data about these funerary practices and allowed for the recovery of some biological data about these prehistoric communities, regarding sex ratio, age at death profile, but also of some morphological and paleopathological indicators. Apart from the until now unique Late Neolithic primary depositions identified in pits, all the other Perdigões structured funerary contexts represent balanced universes of total commingling between sexes and ages, high levels of manipulation and episodes of tomb re-visitation in which no direct association between grave goods and individuals has been possible, transpiring a sense of dilution of any idea of individuality.

If we consider that aggregation centres like Perdigões can be understood as a "microcosm" which reflect the wider social reality of the recent prehistory communities of SW Iberia, these funerary realities call for a reflexion about the adequacy of the inquiries and conceptual tools that have traditionally been used to address these contexts. A discussion that will hopefully contribute towards the theoretical debate proposed by the present EAA session through an approximation to its questionnaire and the implications that derive from it.

08 CITATION AND GENDER PRODUCTION IN MORTUARY PRACTICE: AN EXAMPLE FROM EARLY BRONZE AGE IRELAND

Author(s): Houghton, Mark (University of Cambridge)

Presentation Format: Oral

The small scale of many prehistoric cemeteries presents a problem for studies of gender. Methods which rely upon statistical analysis force us to seek out larger datasets of skeletons with sex attributions. This has effectively encouraged us to amalgamate

populations on a regional or national scale. While this has allowed the identification of broad trends, it limits our discussion of gender to a scale beyond the local scale at which it was enacted and experienced. In effect, we have instituted a level of abstraction from the focus of our investigation.

This paper discusses how careful attention to mortuary practice can expand the opportunities for us to investigate gender in the local sphere. The argument begins from the premise that every action taken as part of mortuary practice is meaningful, in the sense that it has the potential to carry meaning. Communities at the graveside were enmeshed in a historical trajectory, and their actions both accorded with or differed from previously established cases. Consideration of these citation strategies allows us to investigate how meaning was created and enables an investigation of gender which is firmly rooted in the local.

This will be demonstrated by investigating the smallest funerary deposit, the single burial alone in the landscape. Such burials are a key feature of Early Bronze Age burial practice in Ireland and elsewhere, and they have usually been folded into larger social analyses, effectively erasing their particularities. This example will demonstrate that careful attention to the community's citation strategies can open up new avenues for gendered meaning in prehistoric burials.

09 BEAUTIFUL WARRIORS AND WEAVERS: GENDER IDENTITIES IN LATIUM VETUS IN FINAL BRONZE AGE 3 (C. 1050-950 BC)

Author(s): Venderbos, Ilona (Vrije Universiteit Amsterdam; CLUE +)

Presentation Format: Oral

Regarding the Final Bronze Age 3 funerary record in Latium Vetus (near Rome), especially the cremation burials containing extended panoplies of miniature weapons have gained much scholarly attention. Such tombs belonged to adult men interpreted as military and religious leaders. However, recent excavations and re-examination of late 19th and early 20th century finds show that not all adult males were buried with weapons. And not only adult men, but also a number of adult and subadult women were granted formal burial through cremation, in some cases with status markers. Based on these data, scholars have recently pointed out that the picture might have been slightly different, and that individuals with other roles than military or religious could have existed.

In the context of a PhD dissertation the author conducts on the relation between redefinitions of gender identities and the profound societal transformations attested in Italy from roughly the 10th to 6th century BC, the Final Bronze Age 3 cremations from Latium have been analysed in terms of gender identities (these early burials being the point of definition for understanding transformations of gender identities in later phases). The results of this analysis are presented in this paper. Within the presentation of the results, special attention is paid to how the application of recent insights from gender- and funerary archaeology (e.g. personhood, transformations of identities, mixed genders or gender ambiguity, intersection of different forms of identity) has contributed to a balanced reconstruction of the gender identities expressed in these Latial burials. Finally, the question is put forward whether these identities reconstructed from the funerary context can be connected to specific social roles these individuals might have had in society – be it military, religious or other (gendered) roles.

10 RITUAL OF “VOLUNTARY DEATH” AMONG THE POPULATION OF SARGATKA CULTURE IN THE EARLY IRON AGE

Author(s): Chikunova, Irina (Federal State Institution Federal Research Centre Tyumen Scientific Centre of Siberian Branch of the Russian Academy of Sciences)

Presentation Format: Oral

Burial rites of the Sargatka population were studied on the materials of many cemeteries. It has canonicity, which is caused by a certain set of principles of funeral practices and paraphernalia. In the mounds were buried the chiefs of the nobility, the wealthy commoners. In the grave were placed the vessels, weapons, ornaments and attributes. Women and Children in the mounds were buried very rarely.

In the Tobol river valley there are about 50 cemeteries. Some of them were investigated by archaeological excavations. The number of settlements and fortresses exceeds the number of necropolis. The discrepancy between the number of living and buried is obvious. There is a question at the analysis of burial grounds-where old men are buried? patient? children? An alternative way to landfills existed, perhaps. New digs give new materials and facts. The results of the excavations of the settlement Lipikha we can assume that the population practiced the custom of “voluntary death”. An old or sick person was a hindrance to nomadic groups of pastoralists or hunters. The man was left alone in the house on the settlement or thrown into the forest. In the village of Lipikha studied a small square building, tent. On the floor there were traces of hearth and wooden sleigh. On them the man 30-35 years was planted, legs are extended to a fire. In his right hand was a bowl of porridge. But he was mortally wounded or ill, could not move independently. He died without leaving his home. Perhaps, sick man specifically isolated from society. The custom of “voluntary” deaths of terminally ill or elderly people was perceived as a medical measure to preserve their family, tribe, community.

11 SEARCHING FOR THE SOCIAL MATURITY: STUDY CASES FROM THE MIDDLE AND LATE IRON AGE BURIALS IN THE TERRITORY OF LATVIA.

Author(s): Erkske, Aija (Institute of Latvian History at the University of Latvia)

Presentation Format: Oral

Middle and Late Iron Age (5th – 12th century) in the territory of Latvia provides as with a great amount of archaeological data from burials, hillforts and settlements. Unfortunately, there are no written sources from this period that could shed some more light on the complicated questions about society, social practices and structures within a community. One of these questions concerns adult – subadult relationships and interactions, their role and status in the society. More specifically – what are children and when do they become adults? Were there any particularly transition processes into social maturity and can they be traced within archaeological material? Are there any specific artefacts or grave-goods' set that could indicate that particularly dead were considered as an adult within society? And what is the biological age threshold when these changes occur? There are some mentions in Latvia's archaeological literature about specific artefacts (as women head and chain ornaments) that could be linked with a girls' social maturity. However, they are quite expensive ornaments and could also be linked with a higher social status. Artefacts, which are usually associated with a male status are weaponry but analysed study cases show that some local tribes accompanied their male gender deceased with weapons already from the early age and it cannot indicate the dead maturity. Although there is no one specific adult artefact that can be certainly linked with a social maturity, there are "completed" gendered grave-goods' sets that could indicate the changes of the deceased's social status. These changes can be observed at the threshold of approx. 8-10-years-of-age, however, there are slight differences between local tribes and their burial traditions.

12 A QUANTITATIVE AND DIACHRONIC STUDY ABOUT SOCIAL INEQUALITY BASED ON ARCHAEOLOGICAL CULTURES IN SOUTH-WEST GERMANY

Author(s): Großmann, Ralph (Kiel University)

Presentation Format: Oral

The development of social inequality has been considered as a process that goes from more equal societies to more unequal societies, which usually occur with the introduction of technological innovations such as new subsistence economies and metal productions.

Based on the Gini coefficient, which has been used in economics as tool for computing inequalities, degrees of inequality were measured for five cemeteries from South-West Germany, which differed regarding archaeological culture. The results were correlated with independent anthropological data, such as gender, age, and stable isotope ratios ($\delta^{13}C$, $\delta^{15}N$).

The aim was to prove whether an increase of inequality from the Early Neolithic to the Early Medieval period could be inferred and whether anthropological data matched wealth distributions of the respective cemeteries.

As a result, the analyzed Early Neolithic and Early Medieval cemeteries revealed a high degree of inequality whereas the Early Bronze Age cemetery revealed a low degree of inequality. The high degree of inequality was probably triggered by dietary causes (Early Neolithic) or armed conflict (Early Medieval). Moreover, the degree of inequality of males and females differed. In the Neolithic sites, females had a higher degree of inequality than males. By contrast, among the Early Bronze and Early Iron Age sites, the situation was reverse. Moreover, the wealth distribution differed also with respect to age in context of gender and archaeological culture.

The distribution of stable isotope ratios ($\delta^{13}C$, $\delta^{15}N$), which relate among others to the access of animal proteins, coincided especially with the distribution of material wealth at the Early Iron Age site.

Overall, the synergy of methods and data from different disciplines enhanced the image of social inequality in the past for South-West Germany.

13 ANCIENT DNA ELUCIDATES SEX-BIASED CULTURAL PRACTICES THROUGH DIFFERENCES IN POPULATION SIZES AND ANCESTRIES

Author(s): Hofmanová, Zuzana - Wegmann, Daniel (Department of Biology, University of Fribourg, Switzerland; Swiss Institute of Bioinformatics, Fribourg, Switzerland)

Presentation Format: Oral

Studies that center on differences between males and females in the funerary record often suffer from limitations related to sex determination of human remains, especially so for young individuals, incomplete skeletons and populations with unknown sex variation of skeletal markers. In case of DNA survival, genetic determination of sex is due to new sequencing technologies relatively straightforward. Moreover, it is often by-product during screening for samples with large amounts of preserved ancient DNA. Here we present several cases in which paleogenetic sex determination significantly differed from other methods (often traditionally applied) and resulted in a strikingly different interpretation of the archaeological context.

Furthermore, statistical analysis of ancient DNA data can bring further insights into sex-specific behaviours of ancient societies. Individual ancestries can be traced from ancient genomes and it is therefore feasible to establish differential ancestral composition of female and male individuals in the studied population. This can be used to determine and measure sex-biased migration events or locate sources of sex-biased exogamy. Additionally, by comparison of heterozygosity on X chromosome and autosomes, we are able

to determine from even a single female ancient genome the ratio of females to males that have participated on reproductive behaviour in the past. We apply these methods on publicly available ancient DNA data and the differences between sex-specific effective population sizes and individual ancestries in different periods and cultures help us determine sex-specific cultural practices (e.g. patrilocality) of ancient societies especially as a result of comparisons to ethnological and genetic studies of modern populations.

a. SYMBOLISM OF GRAVES WITH WEAPONS IN THE EARLY BRONZE AGE: USE-WEAR ANALYSIS OF METAL DAGGERS IN BOHEMIA

Author(s): Petriscakova, Katarina (The City of Prague Museum; Department of Archaeology, Charles University) - Vercik, Marek (Institute of Classical Archaeology, Charles University) - Limbursky, Petr (Institute of Archaeology of the CAS, Prague) - Pavuk, Peter (Institute of Classical Archaeology, Charles University)

Presentation Format: Poster

While use-wear analysis of stone tools is quite well established in the Czech Republic, much less attention has been paid to the potential of use-wear traces on prehistoric metal weapons. This pilot study presents such an analysis for selected copper-based daggers in the graves of the Aunjetitz Culture in the Early Bronze Age, the Reinecke stage A1 and A2. There are several reasons for the study of this specific group of artifacts. Daggers occur in the graves with both “typically” male or female grave offerings. This study suggests two basic questions. First, whether the copper-based daggers were actually actively employed before deposited in the grave or whether they had only symbolic function in specialized social context? Secondly, whether it is possible to define more precisely the specific use of such daggers in a gendered context? In other words, whether we can register differences of use-wear marks in case of male or female burials. The functional analysis was carried out on ten daggers with a wider and a narrow blade from two Central Bohemian burial grounds in Prague-Nové Butovice and Mělník, which can be considered a representative sample of daggers from the Early Bronze Age in our region. The gained results are compared with other relevant records from the wider area of Central Europe (Germany, Poland, Slovakia, Austria).

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EL ARGAR AND THE EUROPEAN BRONZE AGE – RISE AND FALL OF THE FIRST STATE SOCIETY IN THE WESTERN MEDITERRANEAN

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Risch, Roberto (Autonomous University of Barcelona) - Haak, Wolfgang (Max Planck Institute for the Science of Human History, Jena) - Lull, Vicente (Autonomous University of Barcelona) - Micó, Rafael (Autonomous University of Barcelona) - Rihuete-Herrada, Cristina (Autonomous University of Barcelona)

Format: Regular session

El Argar is a unique socio-economic and political entity in the West Mediterranean between ca. 2200-1550 cal BCE. Archaeologically, it is chiefly characterized by hilltop settlements, with specialised workshops, storage rooms, large water reservoirs and other monumental buildings, as well as a very particular intramural burial ritual, organised along rather strict sex, age, and social class divides. The Argaric society went through a series of changes that led to larger and architecturally more complex urban or proto-urban centres controlling a territory of ca. 35.000 km². Until recently, our understanding of El Argar was mainly based on the funerary evidence recovered by the Belgian engineers Henri and Louis Siret at the end of the 19th century. During the last years, large scale excavations at settlements such as La Bastida and La Almoloya are providing a much more complete picture of this society. Research carried out in the mining districts of the eastern part of Sierra Morena, as well as excavations in settlements located at the eastern fringes of the El Argar territory are also providing a better understanding of the internal differences in this vast area. Lastly, bio-anthropological evidence from isotope and ancient DNA work provides first insights into mobility, demography, kinship, and populations affinities. The aim of the session is to provide an overview of this recent research and to discuss the socio-economic and political organisation of El Argar. Contributions to this session should refer to the over-regional connections between El Argar and other contemporary Bronze Age societies.

ABSTRACTS

01 STABLE ISOTOPES OF CHARRED SEEDS FROM EL ARGAR CULTURE: INTERPRETING PAST ENVIRONMENTAL AND AGRICULTURAL CONDITIONS

Author(s): Aguilera, Monica - Voltas, Jordi (University of Lleida) - Llull, Vicente - Rihuete, Cristina - Micó, Rafael - Risch, Roberto (Departament de Prehistòria, Edifici B, Universitat Autònoma de Barcelona)

Presentation Format: Oral

The Argaric culture was a highly-developed political and economic entity that developed in the western Mediterranean between ca. 2200 cal. BCE and 1550 cal. BCE. During its 650 years of existence, the Argaric civilisation suffered a number of changes in the political, economic and social orders until its collapse as urban society. The structure of Argaric settlements indicates the ex-

istence of clearly differentiated social groups. This social hierarchy and the organisation of the territory were linked to the use of different resources. In particular, the cereal production had an important role along with the management of surplus production, the construction of storage structures and the development of grinding equipment. However, the reason or reasons behind the disappearance of the Argaric societies remain unclear to date. A combination of social and environmental factors seems to be the most plausible explanation of the breakdown and abandonment of the Argaric sites. This study aims to shed light on this issue. More than 250 archaeological cereal charred seeds of *Triticum aestivum/durum* and *Hordeum vulgare* from different Argaric settlements were analysed for carbon and nitrogen isotope composition and characterised morphometrically. Based on this information, we estimated the evolution of grain weight of wheat and barley and inferred the water available for crops, the fertility of soils and the crop management practices. In this way, we carried out a quantitative reconstruction of the environmental conditions in the Argaric period so as to understand the implications of environmental changes in the decline of this emblematical civilisation.

02 PUNTA DE LOS GAVILANES: A SINGULAR ARGARIC BRONZE AGE SITE ON THE COASTLINE OF MAZARRÓN BAY (SOUTHEAST OF IBERIAN PENINSULA)

Author(s): Ros, Milagros (University of Murcia) - Morales, Arturo - Roselló, Eufrasia (Autonomous University of Madrid) - Navarro, Francisca (University of Murcia) - Rodríguez, Tomás (Polytechnic University of Cartagena) - Carrión, José - Rivera, Diego (University of Murcia)

Presentation Format: Oral

Along with the cultural changes that took place around 2.200 cal yr ANE in many of the territories of Western Europe, a small group of people from the Argaric Bronze Age occupied a coastal promontory in the central area of Mazarrón Bay (Southeast of the Iberian Peninsula). This is known as Punta de Los Gavilanes and located near to Port of Mazarrón (Murcia, Spain).

This occupation took place after a dry period, marked by a marked episode of severe aridity evidenced in this area between c. 4540-4400 cal yr BP coinciding with a tectonic reactivation on that portion of the coastline. Such climatic event is probably coupled with similar episodes of the same nature recorded in the Mediterranean area. During that time, Punta de Gavilanes was still an islet lying next to the coast. Nonetheless, by the time the argaric group settled Punta de Los Gavilanes, it was already connected by a coastal bar to the littoral. It was a period of a warm and humid climate of higher ecological diversity in a coastal lagoon-flood plain. This environment was the one associated with the evolution of the human group until the c. XVII cal ANE. Afterwards, up until the c. XVI cal ANE, when a postargaric group occupies re-settled the promontory.

The singularity of the Argaric settlement at Punta de Los Gavilanes lies in the evidence of exploitation of the marine environment. Also worth stressing, is subsistence on a littoral area of marked salinity, featuring the cultivation of cereals, barley and, to a lesser extent, wheat, and the breeding of small livestock population mainly of sheep and goats.

03 REPRESENTATION OF THE MAIN ANIMAL SPECIES IN AN ARGARIC SITE AND IMMEDIATE SURROUNDINGS IN SOUTH-EASTERN IBERIA: CARAMORO I (ELCHE, SPAIN)

Author(s): Jover Maestre, Francisco (Instituto Universitario de Investigación en Arqueología y Patrimonio Histórico. INAPH. University of Alicante) - Andúgar Martínez, Lourdes (Departamento de Prehistoria, Universitat Autònoma de Barcelona) - Martínez Monleón, Sergio (Departamento de Prehistoria, Arqueología, Historia Antigua, Filología Griega y Filología Latina, Universidad de Alicante) - López Padilla, Juan Antonio (Museo Arqueológico Provincial de Alicante)

Presentation Format: Oral

In this paper, we discuss the results obtained with the evaluation of the management strategies of the main domestic and wild species in the Argaric society. The analyzed sample contemplates the species documented in the Argaric archaeological sites of Caramoro I, Cabezo Pardo and Tabaià (Alicante).

The results of Caramoro I are the most recent archaeozoologic contribution of the Argaric society. The sample collects the animal bones recovered in the beginnings of the excavations in Caramoro I between 1981 and 1989, but also in the most recent ones, carried out in 2015 and 2016. The main difficulty has been to unify the several contexts within the site between the first excavations and the last, also with different quality of information. It has been possible to compare the different spatial provenances within the settlement and to explain the distribution of species.

In addition, the study based in the representation of animal species compares synchronically samples from other sites inside the socio-economic context of Caramoro I in Alicante, being these the assemblages from Tabaià and Cabezo Pardo. These recently excavated Bronze Age sites are located in different geographical areas and have provided a faunal archaeological record of great interest. These data allow an adequate context to the faunal information obtained in Caramoro I.

Finally, we associate these results with the animal management strategies of the Argaric societies in South-eastern Iberia.

04 DIET RECONSTRUCTION IN THE EL ARGAR CULTURE USING STABLE CARBON AND NITROGEN ISOTOPES

Author(s): Alt, Kurt Werner (Danube Private University Krems Austria) - Rihuete, Cristina (Departament de Prehistòria, Edifici B, Universitat Autònoma de Barcelona) - Held, Petra (Department of Biomedical Engineering and Institute for Prehistory and Archaeological Science, Basel University) - Lull, Vicente - Micó, Rafael - Risch, Roberto (Departament de Prehistòria, Edifici B, Universitat Autònoma

de Barcelona) - Voltas, Jordi (Departament de Producció Vegetal i Ciència Forestal, Universitat de Lleida) - Fregiero, Marie-Inés - Oliart, Camila (ASOME - Universitat Autònoma de Barcelona) - Knipper, Corina (Curt-Engelhorn-Center of Archaeometry, Mannheim)

Presentation Format: Oral

Stable isotope analysis of human and animal skeletal remains is a powerful tool to reconstruct the diet and the subsistence strategies of prehistoric and historic populations. Until now, only few isotopic studies have been published for the prehistoric Iberian Peninsula and we are not aware of any investigations that include samples of contemporary crops such as wheat or barley. Here we present stable carbon and nitrogen isotope data of human and animal bones as well as charred seeds from different sites of the El Argar culture in Spain (La Bastida, Monteagudo, Lorca, Gatas, El Oficio, El Argar). Exploration of the isotopic variability of potential food sources and along the trophic chain provides the basis for interpreting the stable isotope compositions of the human collagen. Variation within and among the investigated sites indicates not only – or not necessarily – social inequality, but also differences in the organization of agriculture and domestic animal husbandry. For each of the six sites, we discuss the isotopic values and resulting assumptions on dietary composition, including weaning practices, in the context of their specific anthropological and archaeological settings. Comparing the sites, we demonstrate how the human diet was influenced by agricultural practices, animal husbandry, settlement organization and social asymmetries.

05 ROCK SUPPLYING STRATEGIES IN EL ARGAR: AN ECONOMIC PERSPECTIVE

Author(s): Risch, Roberto - Delgado-Raack, Selina - Ache, Mireia (Universitat Autònoma de Barcelona)

Presentation Format: Oral

Macro-lithic artefacts provide key insight into the economy of past societies, as they intervened at different levels of the productive cycle. The large quantities as well as dimensions of artefacts found in El Argar settlements speak for the volume of raw materials consumed and, hence, the effort invested in the identification of appropriate rock sources and their transport to the hill-top settlements. Ultimately, the surplus production of El Argar and its circulation materialised in these macro-lithic tools during its 650 years of development between 2200-1550 cal BCE.

This presentation will focus on the procurement and distribution strategies of the lithic resources in the El Argar core region as one of the most important indicators of its political organization. How does the raw material supply reflect the economical capacity of each settlement? Why are marked differences in terms of raw material supply observed between neighboring settlements? Which are economic and physical implications of working with materials with varying material properties and implying different work input? What political factors seem to have been crucial to the El Argar procurement strategies? Petrographic analysis of several thousands of macro-lithic artefacts of different settlements of Almería and Murcia, as well as geo-archaeological surveys carried out in their surroundings will allow us to define the political mechanisms acting behind the El Argar economy.

Finally, we will discuss these results in the context of the rock procurement strategies observed in other early state societies of the Bronze Age.

06 PREHISTORIC MINING AND METALLURGY IN THE COSTAL REGIONS OF SE IBERIA DURING THE 3RD AND 2ND MILLENNIA BCE

Author(s): Escanilla, Nicolau (Universitat Autònoma de Barcelona - ASOME) - Micó, Rafael (Universitat Autònoma de Barcelona) - Pernicka, Ernst (University of Heidelberg) - Risch, Roberto (University Autònoma de Barcelona)

Presentation Format: Oral

Recent investigations have provided a detailed understanding of the mining, distribution and mixing of different types of copper ores during the 3rd and 2nd millennia BCE. While minerals with and without arsenic played a crucial role during the Copper Age and the beginning of El Argar, in late Argaric times we observe the gradual introduction of “true bronzes”. Moreover, while during the 3rd millennium different minerals are used in the coastal area of SE Iberia (Almería, Murcia, Alicante) and in the inner regions (Granada, Jaen), after c. 2000 cal BCE the El Argar metals were mined and smelted mainly in the eastern margins of the Sierra Morena, in settlements such as Peñalosa, from where copper would have circulated across the El Argar territory, occupying c. 35.000 km².

Our presentation will focus on these issues by reconsidering the chemical analyses of the Stuttgart SAM project, and by discussing new chemical (PIXE-RBS) and isotopic analyses of a large group of metal artefacts from different settlements located in the coastal valleys between Almería and Alicante. Beyond the question of the provenance of the ores and their distribution, this data also allows to re-address the question of intentionality of the production of arsenical copper and the standardisation of the chemical compositions of metals during El Argar with respect to earlier periods. Finally, we will deal with the first introduction “poor” bronzes (1-2 % Sn) and the later appearance of bronze with 8-10% Sn. The effect of the appearance of bronze does not only concern the discussion of the intentionality of the production of arsenical copper, but it also leads to new hypotheses on the circulation of copper and tin in the El Argar territory.

07 MINING AND METALLURGY IN THE ALTO GUADALQUIVIR ARGARIC TERRITORY. BASIS FOR A REGIONAL-SCALE PRODUCTION

Author(s): Moreno-Onorato, Auxilio - Contreras-Cortés, Francisco - Arboledas-Martínez, Luis - Alarcón-García, Eva - García-García, Alejandra - Mora-González, Adrián (Department of Prehistory and Archaeology, University of Granada) - Padilla-Fernández, Juan Jesús

(Department of Prehistory. University Complutense of Madrid) - Vico-Triguero, Laura (Department of Prehistory and Archaeology. University of Granada)

Presentation Format: Oral

The recent excavation and prospecting work have reasserted that the southern foothills of the Sierra Morena, they confirm his great role played in the development and consolidation of the mining and metallurgy of copper in the Argaric Culture. Particularly, the archaeometallurgy record of Peñalosa, Baños de la Encina (Jaén) express itself as the most comprehensive not only to explain the technological chain of the metallurgy of copper but also to attest to the importance of this economic sector within the Argaric societies.

Evidence such as the archaeological documentation of a large dump site of slag and fragments of oven along with the mass production of copper ingots, proved this for sandstone molds and pottery; tools and prestige objects; production spaces and structures; etc., that during the argaric metallurgical production was made in oriental Sierra Morena on an industrial scale and at a regional level that would possibly cover the whole argaric and lands of the hinterland.

At this datum and archaeology evidences, we must add the recent knowledge generated by the prospecting works, from which knowledge about new copper mines located in the Valley of the river Jándula, expressed that metallic copper is being carried out on a large scale in the Bronze Age.

08 EL ARGAR POTTERY: PRODUCTION, USE AND CIRCULATION. NEW DATA FROM AN INTERDISCIPLINARY APPROACH

Author(s): Micó, Rafael - Garrido, Carla - Molina, Elena - Velasco, Carlos (Universitat Autònoma de Barcelona) - Rosell, Antoni (Universitat Autònoma de Barcelona - Institute of Environmental Science and Technologies - ICTA; ICREA)

Presentation Format: Oral

El Argar society developed during the Early Bronze Age (ca. 2200-1550 BC) in southeast Iberia, becoming one of the first state-level societies in continental Europe. As part of its strategy to take control over the means of production, specialized craftsmen generated such a characteristic, sophisticated and highly standardized pottery repertory, comprising mainly eight basic vessel types.

Researches on pottery have mainly focused on morphometric traits often overlooking its functional, economic or ritual dimensions. In the context of the "Bastida Project", we have carried out interdisciplinary studies focused on production, use and circulation of Argaric vessels. This research is based on organic residues analysis, determination of lipid component by gas chromatography/mass spectrometry (GC/MS), chromatography coupled to isotope ratio mass spectrometry (GC-C-IRMS), petrographic analyses and, finally, the measurement of volumetric capacities.

The combination of data drawn from those analysis enables us to suggest several working hypothesis. First, there was a correlation between manufacturing techniques, capacity and material content. Second, many standardized bowls with a capacity of 300 ml can be interpreted as ration or measurement units. In this sense, we suggest that these units were tied to a controlled distribution of foodstuffs by the Argaric elites. Third, some functional differences between vessels found in funerary and domestic contexts may be suggested.

09 MEAT OFFERINGS IN ARGARIC BURIALS (SOUTH-EAST SPAIN, 2200-1550 CAL BCE)

Author(s): Lull, Vicente - Andúgar, Lourdes - Bonora, Bárbara - Micó, Rafael (Universitat Autònoma de Barcelona)

Presentation Format: Oral

Recent excavations at several Argaric (Early Bronze Age, ca. 2200-1550 cal BCE) sites of La Bastida and La Almoloya (Murcia province, Spain) have provided a large assemblage of well contextualised faunal remains from more than 200 single and double graves. La Bastida is a large hilltop settlement covering ca. 4,5 hectares that held a paramount role as a main urban center of one of the most prominent Argaric polities. On the other hand, La Almoloya was a smaller settlement (ca. 0,3 hectares) but having also a key role as economic and political center.

The archaeozoological analysis has determined which species and parts of the carcasses were selected as grave goods. Considering this taxonomic and anatomical data along with detailed contextual information on the position of each item in relation to the human skeletons, our main goal is to gain knowledge about the social use and meaning of animal offerings in the Argaric funerary ritual taking key social dimensions as gender, age and social class into account. Also, we will test and critically discuss the current hypotheses that link the disposal of faunal remains in a certain number of Argaric graves to feasting activities in the context of social and political practices.

10 NEW DATA ON SKELETAL REMAINS AND THE ROLE OF VIOLENCE IN EL ARGAR

Author(s): Rihuete-Herrada, Cristina (Universitat Autònoma de Barcelona) - Oliart-Caravatti, Camila - Fregeiro-Morador, M^a Inés (ASOME - Universitat Autònoma de Barcelona)

Presentation Format: Oral

As in many other so-called complex societies in Bronze Age Europe, violence has been one of the key issues when considering the unprecedented degree of social asymmetries displayed by El Argar society in the context of Iberian Prehistory. Difficult access to central hilltop settlements, fortification devices, appearance of specialized weaponry and its funerary deposition restricted to elite

male graves, are some of the archaeological indicators usually put forward. On the contrary, limited osteological evidence of intentional trauma in human remains has led some authors to suggest that effective violence, especially in the form of warfare, has been assumed rather than either explained or properly documented.

We present new data on traumatic wounds retrieved from two different sites in Moratalla (Murcia), which are especially relevant because of their appearance in the northwest border of El Argar and, more specifically, in frontier contexts. Further anthropological evidence from the fortification complex recently excavated in La Bastida is also discussed. Here, a sizeable quantity of disarticulated human remains with scavenging marks and some evidence of sharp-force trauma has also been found. Evidence from these sites speaks for warrior-prone contexts quite different from core dwelling areas where most of El Argar burials and, thus, human remains come from. This shift in perspective, where skeletal evidence is discussed in qualified contexts allows for an enhanced interpretation of both violence and funerary rites in El Argar.

11 ARGARIC ARCHITECTURE AND URBANISM IN THE LIGHT OF RECENT DISCOVERIES

Author(s): Lull, Vicente - Celdrán, Eva - Micó, Rafael (Universitat Autònoma de Barcelona)

Presentation Format: Oral

El Argar society (southeast Iberia, 2200-1550 cal BCE) shows an unusual architectural and urban development in continental Europe, with domestic, industrial, as well as defensive structures built with masonry techniques. Recent excavations at the sites of La Bastida, La Tira del Lienzo and La Almoloya (Murcia, Spain) have shed new light on the architectural models and urban design expressed in different settlement categories (La Bastida is a large hilltop settlement covering ca. 4,5 hectares that held a paramount role as a main urban center of an Argaric polity; Tira del Lienzo is a smaller site, probably under the rule of La Bastida, specialised in storage and production activities; La Almoloya was a small but prominent economic and political center).

First, a careful analysis of the raw materials and building techniques used along the Argaric sequence enables us to define the changing relations between architectural types and functionally oriented buildings. On the other hand, urbanism reflects an unexpected diversity and complexity: densely populated neighbourhoods, where domestic units, workshops and storage structures form a close web (La Bastida, Tira del Lienzo); large and closely arranged residential complexes, in which economic and supradomestic political activities were performed (La Almoloya); and exceptional monumental structures for water storage and defensive purposes (La Bastida). Finally, the social dimensions of Argaric architecture and urbanism, as well as future lines of research on these issues will be discussed.

12 LIFE DOES NOT WAIT AT THE BORDER. NEW ARCHAEOLOGICAL BASES FOR THE ORIGIN OF EL ARGAR FROM A FRONTIER TERRITORY

Author(s): Jover Maestre, Francisco (University of Alicante) - López Padilla, Juan Antonio (Museo Arqueológico Provincial de Alicante. MARQ)

Presentation Format: Oral

The exceptionality attributed by Luis Siret to the El Argar site conditioned the study about the determination of the origin and development of the Argaric society. All the hypotheses raised about the formation of what we recognize as El Argar culture have considered the existence of a formation territory, as a "nuclear" zone from which would produce an irradiation towards a secondary area "of cultural expansion". Thus, in an initial proposal, the El Argar site itself was considered an irradiating focus.

Recent excavations carried out by the ASOME research group at the Argaric sites of La Bastida and La Almoloya have resulted in the extension of the "nuclear area" and determine the phases of development in the conformation of the Argar culture throughout the Southeast of Iberia. However, the stratigraphy and archaeological contexts of the initial moments of what we recognize as El Argar are still very scarce, so the characterization of their materiality and social practices continues to be a pending issue.

For more than a decade, we have been investigating and excavating in several sites located in the northeastern area of the Argaric territory. Some of these excavations, such as the ones in Laderas del Castillo or Tabayá, brought the opportunity to improve our documental basis about this topic. The excavated archaeological contexts, the stratigraphy and the radiocarbon sequences obtained led us to review the hypothesis proposed to date, as well as to formulate a new one about the conformation of what we recognize as El Argar culture.

13 THE GENETIC HISTORY OF EL ARGAR AND CONTEMPORANEOUS GROUPS OF THE SOUTHERN IBERIAN PENINSULA

Author(s): Haak, Wolfgang (Max-Planck-Institute for the Science of Human History) - Rihuete-Herrada, Cristina - Oliart, Camila - Fregeiro Morador, María-Inés - Lull, Vicente - Micó, Rafael - García Atiénzar, Gabriel - Barciela, Virginia - Hernández, Mauro - Jiménez Echevarría, Javier - Salazar-García, Domingo C. - Risch, Roberto - Krause, Johannes (-)

Presentation Format: Oral

The unique position of the El Argar society in Iberia's Early Bronze Age is well attested by archaeological research. Recent paleo-genomic studies have shed light on the genetic prehistory of the Iberian Peninsula, mainly focussing on the Mesolithic and Neolithic periods. However, the biological profiles of prehistoric individuals attributed to the El Argar and contemporaneous groups from the southern coastal regions of the peninsula have not yet been described genetically. Here, we present genome-wide data

from over 70 individuals from a micro-transect through time ranging from the Late Chalcolithic to the Late Bronze Age. We observe a striking shift in the ancestry profile from the Chalcolithic to the Early Bronze Age, which is explained by the arrival of steppe ancestry in this region. The particular type of ancestry was first described in pastoralist groups from the Eurasian steppes around 5000 years ago and has subsequently spread across central and western Europe, reaching northern France and the British Isles around 2200 calBCE, where it replaced substantial parts of the local genetic ancestry. Our results show that steppe ancestry can be found in very few individuals attributed to the Bell Beaker phenomenon in the centre and north of Iberia, but in all individuals dated to El Argar and subsequent Bronze Age periods in the south. This finding not only corroborates the transformative powers of the Early Bronze Age period in the Iberian Peninsula but show that the genetic profiles of the populations in Iberia today were largely shaped during this time.

14 THE POLITICAL ORGANISATION OF EL ARGAR SOCIETY

Author(s): Rihuete-Herrada, Cristina - Lull, Vicente - Micó, Rafael - Risch, Roberto (Universitat Autònoma de Barcelona)

Presentation Format: Oral

The Argaric is a unique socio-economic and political entity in southeastern Prehistoric Iberia (ca. 2200 and 1550 cal BCE). It is characterized by hilltop settlements occupying 1–5 ha, with specialized workshops, storage rooms, large water reservoirs and other monumental buildings, as well as a very particular intramural burial ritual, organized along rather strict sex, age and social class divides. Argaric society went through a series of changes that led to larger and architecturally more complex urban or proto-urban centres controlling a territory of ca. 35,000 km².

Recent findings and developments in the archaeology of the El Argar society offers one of the best scenarios to understand the rise and consolidation of enduring inequalities among the Late Prehistoric European communities. The general Argaric political organisation, built upon a socio-economic class divide, fits structurally with those of a State according a Marxist approach. Our goal here is to show how this organisation worked at different spatial scales. First, the Argaric territory was divided into several political units formed by a central settlement and a changing number of subordinated villages and farmsteads. Each Argaric polity had its own territories for foodstuff production, but was largely dependent of interregional networks for the supply of copper and silver. On the other hand, the Argaric polities maintained relations of mutual cohesion and, at the same time, mechanisms of exclusion in front of the 'outside' communities. This leads to review the concepts of "frontier" and 'Argarization' in the light of some recent archaeological findings.

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DOES THE "DOMESTICATED LANDSCAPE" HAVE A SPECIAL ISOTOPIC SIGNATURE?

Theme: Theories and methods in archaeological sciences

Organisers: Dobrovolskaya, Maria (Institute of Archaeology Russian Academy of Sciences) - Liden, Kerstin (Stockholm University Department of Archaeology and Classical Studies)

Format: Regular session

Isotopic study of the environment and archaeological sites has become an integral part of modern archaeological research. Recent years researches of the paleolandscapes have demonstrated a significant role of anthropogenic factor in transformation the environmental from prehistoric periods. The processes of fractionation of nitrogen and carbon stable isotopes in the ecosystems (flora, fauna, soil components, biota of water bodies) are diverse and depend on many factors, anthropogenic, in particular. The main topic is the discussion toward the possibilities of isotopic analysis to "estimate" how much the humans of the society of Prehistory and the Middle Ages used food sources, which go from anthropogenic transformed landscapes or natural untransformed ecosystems. Obviously, such a sharp opposition is formal, and are only the coordinates for the presentation of our data. Of particular relevance are such approaches in study the formation of agriculture in the Northern Neolithic Europe, as well as the research of the formation of economy of the migrants on the new lands.

ABSTRACTS

01 WHY WOULD A DOMESTICATED LANDSCAPE HAVE A SPECIAL ISOTOPIC SIGNATURE? HOW IS IT IDENTIFIED, QUANTIFIED AND MADE USE OF?

Author(s): Liden, Kerstin (Archeological research laboratory, Stockholm University) - Angerbjörn, Anders (Department of Zoology, Stockholm University)

Presentation Format: Oral

The isoscape looks different depending on where about in the World you are, no matter if you are in similar environments. So thus, also the fractionation between different tissues which is one of the reasons why we denote e.g. fractionation in nitrogen between different trophic levels to be something in between 2 to 4.5 permil. The reason for this variation is not yet fully understood, but the higher values seem to be found more frequent in high latitude areas, e.g. the Arctic. This is also why it is extremely important to

use contemporary references from the same geographic area in studies of dietary reconstructions in different human populations. Further, with the onset of the Anthropocene and particularly the onset of agriculture we could assume that there is a shift in any particular isoscape we would like to work in. When we start to control food production we also influence the isoscape in which we produce the food that constitute our diet. We know for example that manuring increases the $\delta^{15}\text{N}$ values in cereals grown on fertilized fields. If these cereals are feed to chicken, or pigs, this will influence their $\delta^{15}\text{N}$ values, and so on. How this manipulation could affect the total isoscape in terms of absolute values and variation will be discussed in this presentation as well as if we can identify, quantify and eventually make use of it in archaeological dietary reconstructions.

02 PATHWAYS TO PIG ISOTOPIC SIGNATURE CHANGE DURING EARLY NEOLITHIC: VARIABILITY IN DOMESTICATIONS ACTIONS AND FEEDING PRACTICES

Author(s): Navarrete, Vanessa (Laboratory of Archaeozoology; Autonomous University of Barcelona) - Colonese, Andre Carlo (BioArCh, Department of Archaeology, University of York) - Subirà, Eulàlia (GRAPAC, Unitat d'Antropologia Biològica, Departament de Biologia Animal, Biologia Vegetal i Ecologia. Universitat Autònoma de Barcelona) - Comes, Pau (Institut de Ciència i Tecnologia Ambientals. Universitat Autònoma de Barcelona) - Rosell-Melé, Antoni (Institut de Ciència i Tecnologia Ambientals. Universitat Autònoma de Barcelona; Institució Catalana de Recerca i Estudis Avançats) - Saña Seguí, Maria (Laboratory of Archaeozoology; Autonomous University of Barcelona)

Presentation Format: Oral

Adoption of livestock was a transcendental turning point in the early Neolithic that resulted in significant changes in the social and economic organization of the first farming communities. Among the first domesticated species, pigs (*Sus domesticus*) could have a different dietary isotopic signature compared to the wild specimen (*Sus scrofa*). Such an isotopic signature could have been acquired as a consequence of different pathways and management methods, and can also provide valuable new insights into human-faunal interaction in a domesticated landscape, while offering new perspectives of animal domestication and the differences in management strategies between archaeological sites, perhaps as a function of environmental conditions, site use and community organization. In order to investigate the changes in the dietary isotopic signature of pigs in the NE Iberian Peninsula, we selected a rich assemblage of wild and domestic pig bones from Neolithic sites dated between 5700-3500 cal BC, for carbon and nitrogen stable. The results reveal different isotopic signatures depending on the management method practised: I) there is no difference in the isotopic signature between the wild and domestic pigs, II) the isotopic signature it is different between wild and domestic pigs and does not change during the early Neolithic, and III) the isotopic signature changes gradually in domestic pigs during the Neolithic.

03 HOW TO BECOME A BRONZE AGE CASTLER: DOMESTIC LANDSCAPE OF THE ABASHEVO PEOPLE IN VOLGA REGION

Author(s): Mednikova, Maria (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

A unique Abashevo mound was excavated near Pepkino village in the Mari El Republic, Russia, in 1960. A long pit contained remains of at least 27 persons, had no parallels among the Bronze Age burials of that culture. The mound was a communal grave of warriors – young men, who died in age from 18 till 30 from many lethal traumas caused by battle axes and bows. We just proposed a hypothesis that the buried shared not only the circumstances of death, but certain aspects of life as well. Apparently, these were not merely active young tribesmen who participated in a military operation, but members of a single “male house”. The grave goods of the Bronze Age castler accompanying the burial of individual #8 make up a founder’s toolkit. The current presentation is devoted to the understanding of mobility of Abashevo people. Strontium isotopic ratio was studied in 24 samples from enamel and bones of the buried in Pepkino mound. The control samples included soil, shells, animal bones from different locations of the Volga river region and from Ural area. Control samples of another Abashevo people from excavations of more western sites were also analysed. Our data draw a wide domestic landscape of representatives of the Abashevo culture died in Volga region.

04 DOMESTIC LANDSCAPE OF THE ABRAU PENINSULA IN THE BLACK SEA REGION THROUGH THE AGES

Author(s): Mednikova, Maria (Institute of Archaeology Russian Academy of Sciences) - Batchenko, Victoria (Institute of Russian History Russian Academy of Sciences) - Malyshev, Alexey (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Starting from the Bronze Age, Northern Black Sea region was an attractive place for ancient people of different origin. During the period of classical antiquity it was a frontier between “the civil” and “the barbarian” worlds. The region between antique Gorgippia and Torik became home for tribes of Kerketians, Toretians, Maeotians and by other people, who could be newcomers. Although nature and geography caused relative self-isolation of that region starting from the Classical Age, the political trend of development of Bosporian state reflected in intense migration. Archaeological data can reveal features of material culture indicating migration process. But modern techniques of settlements studies, as well investigation of strontium isotopic ratio in ancient human teeth and bones give evidence for explanation of population growth. Our project is devoted to the study of antiquities and palaeopopulation of Abrau peninsula starting from the Bronze Age till the mediaeval period. Basing on methods of digital archaeology (3D visualization and additive technologies) we try to describe dynamics of anthropogenic landscape. Isotopic study of mobility of representatives of different archaeological populations can help to discover appearance of newcomers to this land during periods of classical antiquity,

05 TERRESTRIAL AND AQUATIC FOOD RESOURCES IN THE ORDINARY DIET OF THE POPULATION OF ANCIENT PHANAGORIA

Author(s): Svirkina, Natalya (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Phanagoria is the largest antic center of urbanization of Tamansky peninsula (Black sea, Krasnodarsky district, Russia). During the long time of existence of this city the population transformed cultural traditions, economy, patterns of agriculture and husbandry. Isotopic approaches “work” as the instrument to study food webs in different landscapes. The isotopic ration ($^{12}/^{13}\text{C}$, $^{14}/^{15}\text{N}$) of 70 skeletons from the graves of the Hellenistic, Roman and Late Roman periods as well as animal bones are considered to estimate cultural and time-related dynamics.

The results indicate differences of the isotopic content in bone samples from graves of Hellenistic and Roman periods. Higher individual variability of the values of delta of ^{13}C and ^{15}N were estimated for the Hellenistic and Late Roman groups. The reason of these singularities on the one hand could be related to the different cooking tradition, on the other hand it could be connected to the different landscape resources use. Hellenistic group is characterized by the significant sea food component. In general Roman period population used land food sources according to the isotopic data. One of the main topic of the study is the identification of marine and terrestrial food webs during centuries.

06 C4 PLANTS IN THE FOOD CHAIN OF MEDIEVAL POPULATION OF NORTH-EAST BLACK SEA REGION: ISOTOPIC AND ETHNOGRAPHIC EVIDENCES

Author(s): Shvedchikova, Tatiana (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

The complex anthropological investigation of the skeletal remains of medieval population of Imeretinskaya Lowland (basilica near Veseloe settlement) and the Eastern part of Abkhazia (Markula basilica) was performed to discuss the morphological particularities, everyday habits, diet and possible migration ways of the groups of people. Basilica in the Eastern part of Imereti Lowland in-between rivers Psou and Mzymta has been studied in 2010-2011. The complex is dated by Middle Byzantine time (9-11 CE). And the cranio-logical and odontological study showed the kinship of the studied population and modern Abkhazians. The investigation of Markula church dated by 5-7 CE starts from 2015. It is located on the territory of modern Abkhazia and ancient Apsylia.

The corn use in the everyday diet of modern Abkhazians got widespread and is well-known characteristic of the region. But isotopic signals similar to C4 plants in medieval population samples posed the question to the possible plant species used as the basic for everyday nutrition. Ethnographical data gives us an example of millet cultivation, which reflects in bone material.

The additional question was to show the highland differences in palaeodiet. $^{86}/^{87}\text{Sr}$ isotope ratio along with carbon and nitrogen signals helped to distinguish the people of local origin and newcomers from the mountain region. The idea of possible seasonal migration goes together with traditional life of Caucasian highlanders.

The investigation is supported by Russian Foundation of Basic Researches. Project #16-06-00277 “Early medieval state on the territory of Abkhazia: the problem of territory and cultural identity”

07 WHO ARE BURIED IN THE GRAVES OF SHUROVO (CENTRAL RUSSIA, VIKING AGE): LOCAL PEOPLE OR OUTLANDERS?

Author(s): Syrovatko, Alexander (“Kolomna Archaeological Center”) - Svirkina, Natalia (IA RAS)

Presentation Format: Oral

Shjurovo site is the funeral complex of medieval ground graves and burial mounds. It is located on the left bank of the Oka river near town Kolomna (Moscow district). All burials contain cremated bones of humans and animals. All burials are divided into two types: “houses of the dead” (VI-VII cc AD) and ground graves (IX-X ccAD). The Oka is one of the largest right tributaries of the Volga and has always functioned as a transport artery connecting the northern regions of the Central Russian Upland with the Volga basin. Currently, the studied area of the Shurovsky burial ground is 4000 sq m, which clearly indicates that this is a very large funerary monument. According archaeological data there are no any large settlements in the area. Palynological data and analysis of phytoliths indicate a minimal anthropogenic impact on the landscape, when the cemetery was in active phase. But who is buried in the numerous burial graves of Shurovo? Traditions that characterize pottery from burials are variate. This fact indicates cultural diversity of the population in general. We did isotopic analysis of the fragments of cremated bones to estimate presense/absence native inhabitants and outlanders. The ratio $^{87}/^{86}\text{Sr}$ were determined for 11 samples (individuals). Anatomically detectable fragments of human compact cebone were used for the samples. The obtained data are characterized by high individual variability (0.709 - 0.713), which indicates that individuals from various settlements of a large area were buried in the Shjurovo site.

08 ISOTOPIC STUDIES IN THE RECONSTRUCTION OF EVERYDAY LIFE OF MEDIEVAL NOVGOROD

Author(s): Reshetova, Irina (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Starting in 2014, the necropolis of St. George's Cathedral in the territory of one of the oldest and most influential monasteries of the Russian North - the St. George's Monastery - is being explored. During this time, 49 burials (predominantly XII century) were revealed. For 19 of them, isotope ratios of nitrogen and carbon in the collagen of bone and dental tissue were obtained.

The results show a wide range in the deltas of carbon and nitrogen in this series. A large cluster (14 samples) is distinguished, exhibiting uniformity - a mixed diet, with a high percentage of the protein component (meat and milk origin). Isolated individuals with sharply different values for the nitrogen content (4 individuals). In the daily diet of these people, there was almost no meat or dairy component. And in the ordinary diet of the individual # 31 a significant proportion was freshwater fish. Among the samples, two belonged to children (infant and child 1.5-2 years old). Among the samples, two belonged to children (infant and child 1.5-2 years old). This suggested mechanism of breastfeeding. The values of isotopes for a child of about 2 years are almost close to the values of adults.

Against the background of other groups of the Middle Ages, the closest isotope ratios from St. George's Cathedral are to such monuments as the Moscow and Dmitrov Kremlin and the burial place of the 13th century Yaroslavl. (Dobrovolskaya, Engovatova, Zaitseva, and al. 2012) The authors suggested the significant role of the social factor in the formation of individual nutrition models, beginning with pre-Mongolian times (The same, 2015).

09 ISOTOPES OF CARBON, NITROGEN AND STRONTIUM IN THE VALDAI'S LANDSCAPES FOR THE RECONSTRUCTION OF MEDIEVAL POPULATION DIET AND MOBILITY

Author(s): Dobrovolskaya, Maria - Reshetova, Irina - Svirkina, Natalia (Institute of Archaeology Russian Academy of Sciences) - Tiunov, Alexey - Kuzmicheva, Evgenya - Krylovich, Olga - Savinetsky, Arkady (Severtsov Institute of Ecology and Evolution)

Presentation Format: Oral

As a rule, paleodiet reconstructions based on general ecological patterns and data of the isotopic composition of local animal bones. The climatic factor influences to the isotopic ratio in the animal and plant tissues as well. Moreover, high variability of isotopic ratio of plants and animals of the same species is expressed. All these circumstances create troubles for reliable reconstruction. The purpose of our study was to assess the variability of local natural flora and fauna within the boundaries of a local area with different landscapes. The area of about 25 km² in the forest part of the Valdai Upland was studied in detail. These lands belonged to Novgorod in the Middle Ages. The bone tissue and enamel of teeth samples of people from medieval burials, which are located at similar landscapes, were collected and studied. The ratio for 13/12 C, 15/14N and 87/86 Sr were estimated. The specific values of the ratio were determined for the soils, trees and low-growing herbaceous plants. A clear relationship between carbon isotopic ratio and terrain characteristics is shown. The relationship between the relief and the 87/86 Sr ratio brightly manifested also. Isotope characteristics of individuals from the Poddub'e-2 medieval burials let to suppose that agricultural lands (places of sowing and grazing) occupied only certain landscape variants.

The study was carried out within the framework of the RFBR project No. 17-06-00543.

10 MEDIEVAL MUROMA POPULATION: THE EMPLOYMENT OF NATURAL AND CULTURAL ECOSYSTEMS (FROM STABLE ISOTOPES ANALYSIS)

Author(s): Zelentsova, Olga - Dobrovolskaya, Maria (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Podbolotievsky funeral site is the largest cemetery of Finnish Muroma population of the end of the 7th - 11th centuries AD. It is located on the lower part of the Oka river near the Murom city. Finnish population occupied this territory during Early Iron Age and Medieval period. We used isotopic analysis to reconstruct nutritional status and economy patterns. The first data on the isotope composition of bone collagen nitrogen and carbon of 23 individuals were obtained. The moderate values of carbon and nitrogen indicate the absence of significant fresh water resources in traditional diet. The value of delta carbon within -19‰ -17‰ is not typical for herbivorous and even carnivorous animals living in natural landscapes of the forest zone. We can assume that such high levels of carbon are associated either with the use of more arid landscapes for agriculture employment, or with the using of millet in everyday diet. The obtained values of nitrogen delta (9-10 ‰) can be classified as moderate. Such values, as a rule, mark the insignificant use of animal proteins. On the other hand, bone collagen of non-ruminant herbivores (horse, for example) are characterized by lower values of delta nitrogen. The low values of the isotopic ratio are typical for domestic pigs, which are grazed at natural landscapes as well. Thus, these data raise a number of important questions. The closest analogies of this "isotopic status" are found in human skeletons from Ryazan-Oka culture of the first half of the 1st millennium AD. So the first data on the isotopic composition of the bone tissue of individuals from the Podbolotievsky burial ground made it possible estimate nutritional status and agriculture patterns. Further studies will help to clarify numerous questions.

THE “ISLAND LABORATORY” REVISITED: INTEGRATING ENVIRONMENTAL AND SOCIO-CULTURAL APPROACHES

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Picornell-Gelabert, Llorenç (ArqueoUIB Research Group, University of the Balearic Islands) - Calvo Trias, Manuel (ArqueoUIB Research Group, University of the Balearic Islands) - Dawson, Helen (Excellence Cluster Topoi; Freie Universität Berlin) - Servera-Vives, Gabriel (ArqueoUIB Research Group, University of the Balearic Islands) - Valenzuela Oliver, Alejandro (Equip de Recerca Arqueològica i Arqueomètrica, Universitat de Barcelona)

Format: Regular session

Islands have played a considerable role in the development of environmental archaeology. Geographically isolated by water, islands are widely considered as ideal laboratories for investigating human impact on “critical ecosystems” and approached as challenging territories in which environmental constraints acquire a crucial role for human development. Parallel to this, islands have inspired the creation of innovative archaeological narratives based on interaction rather than isolation, emphasising the social experiences of landscape and concepts such as fragmentation, connectivity, islandscape and seascape. With limited integration between these two fields, island studies have become polarised between environmental and cultural approaches.

Theoretical approaches tend to disregard palaeoenvironmental data which can shed light on the formation, transformation, and experience of social landscapes. Similarly, palaeoenvironmental data are generally used to support the variety/scarcity of resources available in limited territories with little consideration to accompanying social and cultural issues. Geographical constraints tend to be equated to social isolation, even though archaeological and bioarchaeological evidence often points to the contrary.

With this session we aim to reconsider the “island laboratory” analogy, discussing and integrating paleoenvironmental, bioarchaeological and archaeological research. The session is open to studies dealing with i) the identification of social connection/isolation of islands through different kinds of archaeological records; and ii) the exploration of landscape practices and experiences combining paleoenvironmental and archaeological information. Disciplinary or geographical boundaries are deliberately avoided in order to generate discussions that bridge arbitrary theoretical/scientific divisions or geographical/historical specificities, with the aim to widen our archaeological understanding of nature-culture interactions on islands.

ABSTRACTS

01 HIPPOS AND FARMERS--PRE AND EARLY NEOLITHIC ISLAND VOYAGERS IN THE MEDITERRANEAN AND A REASSESSMENT OF THE “ISLAND LABORATORY”

Author(s): Simmons, Alan (Universities of Nevada, Las Vegas and Reno)

Presentation Format: Oral

While the Mediterranean islands have a long history of archaeological research, it is only relatively recently that convincing evidence has emerged for either pre-Neolithic or very early Neolithic occupations on these islands, including the more oceanic ones such as Cyprus and Crete. We now know that on some of the islands, a human presence likely extends back to the Middle Pleistocene and potentially involved pre-Homo sapiens peoples. There also is growing evidence of later, Epipaleolithic occupations of some islands, and of full colonization by the early Aceramic Neolithic, at least in Cyprus. This recent research calls for a re-imagining of the concept of islands as remote laboratories, suggesting far more interaction with mainlands. As such, this calls into question the entire concept of islands as isolated and “pure” laboratories. Rather, the sea might be viewed as a sort of “highway” for communication between mainlands and islands. Despite this, however, islands remain challenging adaptations for humans, and their often limited resources structured economic and social adaptations. Furthermore, in the case of Cyprus at least, human-induced environmental impacts and consequences may have been more severe during the pre-Neolithic, resulting in the extinction of endemic fauna, whereas the earliest farmers may have had a more harmonious ecological relationship. This new evidence is assessed within the context of the absolute necessity of using integrated interdisciplinary perspectives to obtain what are often very elusive data relating to island adaptations. Such an approach, integrating both cultural and environmental concepts, will allow the Mediterranean islands to be viewed as both connected to the mainlands but also offering opportunities for the construction of unique “island identities.”

02 RE-THINKING MINOAN RESOURCE MANAGEMENT: PALAIKASTRO, CRETE, IN CONTEXT

Author(s): Livarda, Alexandra (Department of Classics and Archaeology, University of Nottingham) - Orengo, Hector Aleix (McDonald Institute for Archaeological Research, University of Cambridge) - Riera Mora, Santiago (Department of History and Archaeology, Seminar of Prehistoric Studies and Research, University of Barcelona) - Cañellas-Boltà, Nuria (Institute of Earth Sciences Jaume Almera - ICTJA-CSIC, Barcelona) - Veropoulidou, Rena (Museum of Byzantine Culture, Hellenic Ministry of Culture and Sports) - Tzevelekidi, Vasiliki (Ephorate of Antiquities of West Attica, Piraeus and Islands, Hellenic Ministry of Culture and Sports) - Picornell-Gelabert, Llorenç (ArqueoUIB Research Team, University of the Balearic Islands) - Tsoraki, Christina (McDonald Institute for Archaeological Research,

University of Cambridge) - Marlasca Martín, Ricard (Posidònia S.L.) - Knappett, Carl (Department of the History of Art/ Graduate Department of Art, University of Toronto)

Presentation Format: Oral

This paper focuses on the island of Crete and in particular on its easternmost part. The research programme PALAP on the Bronze Age (Minoan) town at Palaikastro and its surrounding territory is discussed here to allow new insights into some of the key processes that led to the emergence of Minoan civilization, and to provide alternative readings of human and landscape interactions in an island context. Agricultural surplus production, particularly of cereals, vine and olive, and its management has been at the core of the debates on the development of social complexity in Minoan society, although primary direct data, such as plant remains, have not contributed substantially to the debate so far. Our PALAP project combined for the first time in Crete an innovative approach of integrated landscape and on-site investigation with the aim to approach and evaluate anew resource management while providing new primary data. Systematic on-site collection of bioarchaeological remains, by sampling all excavated units and screening all soil, allowed for the first time an examination of both presence and absence of all micro- and macroscopic remains. At the same time, targeted palaeoenvironmental and landscape survey, the latter not for the traditional location of sites, but with the aim to understand the environmental resources and their management, were conducted in a complementary manner. Our results show how the town developed in an already well exploited environment since the Neolithic and how this human-environment relationship shaped the landscape, foodways, everyday life and ultimately the fortune and final demise of Palaikastro within the context of Minoan civilization.

03 HUMAN-ENVIRONMENTAL INTERACTIONS, PALEOGEOGRAPHY, AND BIODIVERSITY ON CALIFORNIA'S SMALL ISLANDS

Author(s): Rick, Torben (Smithsonian Institution) - Braje, Todd (California Academy of Sciences) - Reeder-Myers, Leslie (Temple University)

Presentation Format: Oral

The Pacific Coast of Alta and Baja California contains a number of offshore islands. These include large islands (>100 km²) with abundant resources that were attractive to ancient human peoples for >13,000 years, and numerous small islands (3 km² in area or less) many of which also contain human occupation. Most of these small islands have seen limited archaeological research, however, and are often presumed to have been marginal locations for past human settlement. Today, small islands from the San Francisco Bay to the Channel Islands and Baja California are biodiversity hotspots, providing key habitat for endemic species, breeding seabirds and marine mammals, and rare plants. Here we review the historical ecology of California's small islands, focusing on long-term landscape evolution, human settlement dynamics, and changing biodiversity. Our analysis focuses on four island groups, including Islas Cedros and Todos Santos in Baja California, Anacapa and Santa Barbara islands in the Channel Islands, the Farallon Islands in central Alta California, and West Marin, Angel, and Brooks islands in the San Francisco Bay. When placed in global context, our synthesis of archaeological and environmental data demonstrates the utility of small islands as model systems or laboratories for evaluating changes in global biodiversity and island ecology from the Holocene to the Anthropocene.

04 RECOVERING OLD ROUTES. SHEEP MOBILITY ON THE BALEARIC ISLANDS DURING THE MIDDLE AND LATE BRONZE AGE (CA. 1500-850 BC)

Author(s): Valenzuela-Suau, Lua (University of Balearic Islands) - Valenzuela-Lamas, Sílvia (Consejo Superior de Investigaciones Científicas-Institució Milà i Fontanals - CSIC-IMF)

Presentation Format: Oral

Zooarchaeological studies contribute to understand the economy, the human diet and, ultimately, the exploitation of animal resources in a specific geographical context. In addition, it is known that animal bones allow us to go much further, and provide data to understand other complex issues, like herding practices and mobility.

The study that will be presented here is focussed on the Bronze Age society of the Balearic Islands. It is based on the study of animal bones from different archaeological sites with diverse functionalities and located on a diversity of geographical points of Majorca and Minorca. Other than a synthesis about meat consumption and diet in the Balearic Islands during the Bronze Age, the strontium, carbon and oxygen studies on sheep enamel will provide an insight about animal mobility and animal diet based on isotopic analyses. The results of this research provide invaluable information about the routes that animals and people used in this period and how they managed their animal resources. This also reveals how people perceived their landscape, and to which degree animals were traded between islands and beyond.

Such study will be integrated with other palaeoenvironmental and archaeological studies of the Balearics to better disentangle human-nature relationships during the prehistory in a Mediterranean island context.

05 SEEKING OUT THE ISLAND-ADAPTED BARLEY OF SCOTLAND'S NORTHERN AND WESTERN ISLES

Author(s): Wallace, Michael (University of Sheffield, Department of Archaeology) - Martin, Peter (University of the Highlands and Islands, Orkney College) - Russell, Joanne (The James Hutton Institute) - Timpany, Scott (University of the Highlands and Islands, Orkney)

College) - Bonhomme, Vincent (Institut des Sciences de l'Evolution-Montpellier) - Stillman, Eleanor (University of Sheffield, School of Mathematics and Statistics)

Presentation Format: Oral

Bere is a landrace of barley that has a long association with the Highlands and Islands of Scotland. Today it has a significance to the people of Orkney in particular, and is used in a wide-range of heritage products, from whisky and beer to shortbread and bannocks. Bere's long association with these areas is undoubtedly due to its adaptation to the often marginal conditions of northern Scotland. The identification of when the bere landrace arrived in northern Scotland would not only validate bere's perceived heritage value today, but also contribute to an understanding of how sustainable agriculture emerged in regions far beyond the natural distribution of the wild ancestors of crops.

To address the origins of island-adapted bere and to explore new approaches to the study of landraces in the archaeobotanical record, grains of different barley landraces (including bere) - experimentally grown on Orkney and the Scottish mainland - were distinguished based on Geometric Modern Morphometric (GMM) analysis of their grains. This work demonstrates the potential to recognise different landraces in the archaeobotanical record using GMM, which is of special importance to the study of agricultural development on islands, where unique environmental conditions, limited scope for inter-breeding with mainland crop populations, and concepts of 'island identity' may have had crucial roles in crop selection.

06 THE ROLE OF THE PEDESTAL VESSELS IN DISPLAYING INSULAR IDENTITIES AMONG BRONZE AGE COMMUNITIES IN THE CENTRAL MEDITERRANEAN

Author(s): Magri, Alessandra (University of Bologna)

Presentation Format: Oral

This poster aims to provide a comparative analysis on the pottery production of central Mediterranean islands during the Early Bronze Age. The analysis focuses on the pedestal bowls, a peculiar ceramic class identified both in domestic and funerary contexts, often associated with other table vessels (cups, shallow bowls and small containers) which share a specific function and a remarkable aesthetic/symbolic value.

Starting from the case-study of the settlement of Mursia (island of Pantelleria) and the evidence of links with Sicily, this work is based on a comparison between insular settings, regarded as 'laboratories of social and cultural experiences'.

The analysis will take into account not only the typological aspects of the pedestal bowls, but also specific morphometric parameters (the dimensions and other measurable attributes) and the presence and types of decorations (incised, impressed, painted or plastic) in order to assess the technical expertise of the craftsmen and the emergence of symbolic codes and decorative styles.

This approach will allow to identify similarities and differences in the pottery assemblages; to evaluate the diffusion of artifacts, traditions and lifestyles at a regional or inter-insular scale; to emphasize the peculiar features of insular identity and the creation of common or exclusive islandscapes in the "Middle Sea" during the 2nd millennium B.C.

07 SMALL-SCALE AND LARGE-SCALE SOCIAL CONNECTIONS IN THE PRE-COLUMBIAN CARIBBEAN. ENVIRONMENTAL AND CULTURAL LANDSCAPE ANALYSES IN THE EAST-GUADELOUPE MICRO-REGION

Author(s): de Waal, Maaïke (Faculty of Archaeology, Leiden University)

Presentation Format: Oral

Regional or long-distance contacts between settlements dispersed all over the Caribbean have been identified by different types of provenance studies, including isotope analyses, and studies of style. Micro-regional or short distance contacts, including contacts between settlements and sites on one island and between settlements and sites on islands within the micro-region, are more difficult to establish. For this type of analysis highly intensive and detailed survey data are essential, and it is precisely this type of field investigation that is rare in Caribbean archaeology. An exception is the archaeological survey project that was conducted in the East-Guadeloupe micro-region between 1998 and 2000, of which the data still provide one of the most complete case-studies of micro-regional landscapes in the Lesser Antilles.

The East-Guadeloupe micro-region consists of the Caribbean islands of La Désirade and Petite Terre and the Pointe des Châteaux peninsula of Guadeloupe (French West Indies). A nearly complete full-coverage survey of this area revealed diachronic site patterns and allowed the reconstruction of the occupation history of the micro-region. But more importantly, it allowed an insight in pre-Columbian social, political, economic and ceremonial organization within this area during different pre-Columbian periods. Although seemingly isolated, the different parts of the East-Guadeloupe research area turned out to have been connected on both micro-regional as well as regional scale.

This presentation will address the topics of identifying social connections within and between islands using survey data and archaeological landscape analyses. It will focus on the ways Amerindian occupants of the region impacted the natural environment, and how the physical landscape, in turn, greatly determined the ways the micro-region was inhabited, exploited and perceived.

08 IS NEW GUINEA THE WORLD'S BIGGEST "ISLAND LABORATORY?"

Author(s): Golitko, Mark (University of Notre Dame)

Presentation Format: Oral

Geographers classify New Guinea as the world's second largest island, after only Greenland. Unlike most islands of Southeast Asia, New Guinea was never connected by dry land to Asia, and perhaps as a consequence of its physical separation from the major continents, archaeologists have often conceptualized life on New Guinea using the island laboratory framework—a world of small, largely isolated communities following their own cultural trajectories until the relatively recent past. Yet it is clear that as a place of human habitation, New Guinea bears little resemblance to the small islands of Remote Oceania that have served as primary test cases for the island laboratory model. Such a framework may approximate the cultural trajectory of remote islands, but these represent a fraction of all the places settled by humans in prehistory. I review archaeological and paleo-environmental fieldwork data, and analysis of ethnographic material collections, as well as network analyses of material cultural and linguistic patterning. The prehistory of New Guinea has witnessed dramatic changes in landscape and viability of settlement that may have influenced how well connected the mainland was to more distant places including Southeast Asia. I argue that New Guinea serves as a valuable metaphor for the past not because it is an island, but because it is a dynamic environmental and social backdrop on which to test competing models of the human past.

09 METALLIC ENCOUNTERS IN THE PITYUSIC ISLANDS. LOCAL AND REGIONAL DYNAMICS IN THE 'GLOBAL' BRONZE AGE

Author(s): Sureda, Pau (Instituto de Ciencias del Patrimonio - Incipit-CSIC; McDonald Institute for Archaeological Research, Cambridge University)

Presentation Format: Oral

In this paper, we address models of production, consumption, and interaction of metals developed in Pityusic Islands (Balearic archipelago), an important contact point in Western Mediterranean. We also explore how metals can help in the identification of social connection/isolation in islands contexts.

During the Chalcolithic, we witness the colonization of the Balearic Islands by fully metallurgical societies although evidence of metallurgical production and metallic objects are scarce. During the Bronze Age, a metallurgical growth occurs in this islands and copper-based ornaments and artifacts are locally produced. However, despite large narratives of long-distance trade routes and a first 'globalization' during the Bronze Age, what we observe in the metallurgical production of the Balearics and Pityusic is a continuity on a regional scale of production, using local resources and a minor exchange of products on a supraregional scale. It will not be until the Late Bronze Age/Early Iron Age that the Balearics are integrated into the large Mediterranean commercial circuits.

Possible causes of this metallurgical regionalization in Bronze Age are discussed: the scarce presence of copper minerals would alter social value to metal objects? Why were the Pityusic and Balearics not attractive for long-distance exchanges? What role did metallurgy really play in socioeconomic terms? Was it dispensable in some cases? Could ideological aspects of resistance to external influences come into play? Are we historiographically magnifying long-distance exchanges? Could these be punctual contacts with a little incidence in the organization of production?

10 ALIENS: ARCHAEOLOGY OF INVASIVE SPECIES

Author(s): Hofman, Courtney (University of Oklahoma) - Rick, Torben (Smithsonian Institution) - Hughes, Karissa (University of Oklahoma)

Presentation Format: Oral

Human have translocated plants and animals to islands for millennia. Although numerous projects have investigated translocations and introductions, systematic documentation of the global history of ancient invasion is challenging due to differences in archaeological practice across the world, varying definitions and types of evidence of translocation, and dispersed datasets. Building on recent attempts to establish criteria for evaluating possible ancient translocations, we present a web-based resource for archaeologists, managers, and stakeholders to document ancient wild animal translocations.

We also use the paleoecological record to address the impact of past and present invasion on island ecosystems. This approach allows us to use invasion history to explore the connection/isolation between islands and apply these data to current challenges in island conservation. Using interdisciplinary research from the California Channel Islands as a case study, we discuss the inter-related invasion histories of the island fox, deer mouse, and domestic cat, as well as the conservation implications of invasion. With the help of the research community, our goal is to amalgamate data sets from published and gray literature to investigate the role humans have had in constructing the ecosystems we see today and ultimately, to bring archaeological data to the table in policy discussions of resource management.

11 OBJECTS FOR AN ISLAND WORLD - THE ROLE OF FELSITE IN NEOLITHIC SHETLAND

Author(s): Megarry, William (Queens University Belfast) - Cooney, Gabriel (University College Dublin)

Presentation Format: Oral

The Shetland Islands are the northernmost part of Europe where agriculture was practiced during the Neolithic. Separated from Ork-

ney and mainland Scotland by 160 kilometres of often turbulent ocean, people on Neolithic Shetland developed unique styles and fashions, indicating a potentially insular and closed society. These are most clearly evident in the evolution of distinctive megalithic tomb traditions, and in the exploitation and creation of polished stone 'Shetland knives'. Between 2012 and 2017, the North Roe Felsite Project (NRFP) explored the extraction and distribution of polished stone tools in Shetland. These tools – both knives and axes – are quarried from felsite, an attractive blue-gray rock which occurs as linear north-south dykes in the Northmavine region, North Mainland. Geological analysis of artefacts and dykes suggest that all artefacts were quarried from a number of quarry sites, all in the Northmavine region and forming part of a quarry complex or landscape. From these quarries, felsite is exported within (but apparently not without) the archipelago. The island-wide context of exploitation will be explored in this paper which will summarise results from the project but also present a research agenda for future work focused on the distribution and archaeological contexts of felsite. Based on dates obtained during the project, it will propose that targeted studies of contemporary Early and Middle Neolithic settlements are essential to fully understand the island Neolithic and facilitate a better understanding of the beginnings of this distinctive insular Neolithic society.

12 EARLY MALTESE CERAMICS: THE SCIENCE OF CONNECTIVITY

Author(s): Brogan, Catriona - Malone, Caroline (Queens University Belfast)

Presentation Format: Oral

This paper will examine and reinterpret the earliest ceramic traditions of the Maltese islands in the context of the palaeoenvironmental data obtained by the ERC funded FRAGSUS Project. It will also introduce the MaltaPot Project- designed to further the work of the FRAGSUS Project through the application of archaeometric techniques to the early Maltese ceramic record. MaltaPot will examine the ceramics of the Ġħar Dalam, Skorba and Żebbuġ phases to increase our understanding of the earliest settlers on the Maltese islands, by exploring cultural links through typological, technological and material studies.

The Maltese islands have a particularly rich, diverse and dynamic ceramic assemblage. Early Maltese pottery shares close links with Sicily and Italy- indicating connectivity- but it soon developed its own distinctive styles. To date, the study of the earliest Maltese prehistoric pottery has been dominated by the typological studies devised by Evans and Trump over fifty years ago and no critical re-evaluation of these typologies has been conducted. By integrating the environmental information, obtained from the FRAGSUS Project, with the data from the ceramic assemblage, it is possible to contextualise the environment in which these early ceramics were being produced. Further archaeometric analysis of the ceramics, combined with digital scanning and analysis using automated classification software, will help to identify similarities/ differences between the traditions of the earliest Maltese potters and their Mediterranean neighbours. It is hoped that this multidisciplinary approach will enlighten our understanding of ancient chronologies, aesthetics, technologies, trade networks and cultural ties of the early Maltese.

13 THE CRISIS EFFECT: RISE OF POLITICAL COMPLEXITY ON THE LATE IRON AGE (AD 550 – 1050) ÅLAND ISLANDS

Author(s): Ilves, Kristin (University of Bergen)

Presentation Format: Oral

The Åland Islands, today an autonomous, monolingually Swedish-speaking region of Finland, is made up of nearly 7000 islands larger than 0.25 ha situated in the northern part of the Baltic Sea between Finland and Sweden. Åland has always been linked to movements of people, particularly in the beginning of the Late Iron Age (AD 550-1050) when the archipelago saw the greatest increase in human population and activity, which cannot be understood as an endogenetic demographic process. The rapid population growth is interpreted as a large-scale colonization process. The predominant view on the islands society during that time suggest a low degree of internal stratification and the region has been viewed as a periphery with a very marginal level of political complexity.

The sudden colonisation process to Åland, if explained at all, is explained in the availability of dramatically increasing areas of new and highly productive land through shore displacement and greater opportunities for gaining a livelihood due to maritime resources. The fact that shore displacement throughout the history of the Åland Islands has constantly contributed with new and usable land, and that maritime economy dominated for thousands of years even after the introduction and employment of farming make these explanations unsatisfactory as the issue of 'why now?' has been left substantially unaddressed. I would like to put the rapid and large-scale colonisation of the Åland islands into the context of the extreme weather events of 535-536 AD and demonstrate the growth of the region as an effect of crisis. I also question the view of the Åland Islands as being a political periphery during Late Iron Age. In the light of the newly discovered hall farm, established in the middle of the first millennia, I contextualize the rise of political complexity within climatically induced time of instability.

14 REVISITING COASTAL SAND MOVEMENT IN PREHISTORIC SCOTTISH ISLANDS

Author(s): Gal, Emily (University of St Andrews)

Presentation Format: Oral

Lying off the north coast of Scotland, the Orkney Islands have served as a popular location for exploring human-climate-environment interactions, particularly in the densely-settled coastal zone. Manifestations of environmental change such as sea level rise, flooding, and erosion can have immediate and visible impacts on coastal activities and geomorphology. A notable impact is the

inundation of coastal settlements and landscapes by windblown sand, leading to marginalisation and abandonment of agricultural land. Historical sources provide a detailed view of environmental deterioration and its far-reaching effects on coastal populations throughout Britain, particularly during the Little Ice Age. The identification of sand horizons at coastal archaeological sites attests to similar movements in the prehistoric period. However, the nature of impact and response in the prehistoric record is less clear and requires more attention.

Previous studies of prehistoric windblown sand horizons focus primarily on their use as a proxy for investigating periods of increased storminess and climatic deterioration. The implications of these changes for coastal communities and their socio-economic activities are rarely integrated. This paper presents the results of a doctoral research project which catalogued episodes of windblown (aeolian) sand movement in prehistoric Orkney. The project utilised geophysical survey and luminescence dating to investigate the nature and chronology of sand movement on archaeological sites, before placing this data within the wider socio-cultural context of the region. Familiar themes such as abandonment, marginality and sustainability were reconsidered with an expanded dataset. In this paper, selected multi-period sites in Orkney are used to explore the ways in which complex archaeological and environmental records can be approached and integrated.

15 NETWORKING AS A STRATEGY FOR HUNTER-GATHERER RESILIENCE IN THE KURIL ISLANDS, NORTHEAST ASIA

Author(s): Gjesfjeld, Erik (University of Cambridge)

Presentation Format: Oral

The Kuril Islands of Northeast Asia are a small chain of volcanic islands located in the remote North Pacific Rim. The natural environment of the region presents numerous challenges for habitation including frequent natural disasters, harsh winters, and challenging seafaring conditions. The socio-natural environment of these islands therefore provides an intriguing “laboratory” for investigating human-environmental interactions, the adaptive capacities of human settlers, and the social strategies used for living in marginal island landscapes. Here, I investigate how social networks of Kuril hunter-gatherers were potentially used to mitigate vulnerability by comparing the structure of networks in regions with varying degrees of environmental risk. Results from this work highlight that networks in areas of greater environmental variability tend to have higher density and longer network ties. While interaction networks used by maritime hunter-gatherers of the Kuril Islands may have provided short-term gains in risk-reduction, I also consider whether this increased social interaction may have destabilized Kuril communities leading to widespread abandonment of the region. The conclusions of this research are that despite a constraining natural environment, maritime hunter-gatherer communities of the Kuril Islands were likely embedded within a larger regional exchange system. However, increasing dependence on these outside social connections may have increased their vulnerability to changing social and political circumstances beyond their control.

16 NOT ONLY LAND FOR FARMERS: INTEGRATING ENVIRONMENTAL AND SOCIAL-CULTURAL APPROACHES AT THE LATE PPNA SITE OF AYIA VARVARA ASPROKREMNOS, CYPRUS

Author(s): McCartney, Carole (University of Cyprus)

Presentation Format: Oral

The biogeographical model of ‘island isolation’ is a persistent undercurrent in the study of Prehistoric Cyprus. Descriptions of Neolithic development expect an end in isolation, based on alterations (or conservation) of material culture and amounts of obsidian reaching the island. Recent studies of Anatolian obsidian exchange during the Neolithic of the Near East have extended models of collective social networks to include Cyprus, but many continue to see Cyprus as ‘isolated’, irrelevant to such interaction.

Cyprus provides evidence cultivation and animal husbandry contemporary with ‘core area’ sites, testifying to early Neolithic migration. Yet, a continued focus of broad economic development (farming) at the macro scale of world systems theory, stressing disruptions (climate change and population growth) as the catalysts of island colonization, presupposing all Neolithic sites on the island as farming settlements. Consideration of small and medium scale social-cultural models of migration, that can provide crucial links integrating environmental and social approaches on islands are ignored in this dominant model. But ‘island isolation’ demands barriers rather than obstacles that can be surmounted through human agency, and as advances in the field of seafaring have recently demonstrated, the sea is a highway that negates ‘island isolation’ in the Eastern Mediterranean.

Evidence from the late PPNA site of Ayia Varvara Asprokremnos provides environmental data at medium and micro levels that require us to look beyond the ‘island (farming) laboratory’ as the only scenario explaining the Cypriot Neolithic. By taking a landscape view encompassing resources beyond available land and micro scale considerations of the local site environment, we can define a new kind of Neolithic taskscape for the island that marries social processes like specialization, defined in a temporal framework of site formation processes, to seafaring interaction.

17**LAND-USE HISTORY IN AN AFRICAN SMALL ISLAND: THE PALEOENVIRONMENTAL AND ARCHAEOLOGICAL RECORD OF MANDJI (EQUATORIAL GUINEA)**

Author(s): Ferro-Vázquez, Cruz (Department of Archaeology, University of York) - Picornell-Gelabert, Llorenç (ArqueoUIB Research Team, University of the Balearic Islands) - González-Ruibal, Alfredo (Instituto de Ciencias del Patrimonio. Consejo Superior de Investigaciones Científicas)

Presentation Format: Oral

The Island of Mandji, off the Gabonese and Equatorial Guinea shores, provides an excellent opportunity to trace back the history of human-driven environmental modifications and their consequences from a socio-ecological perspective. With a 15 Km² surface and separated only 25 Km from mainland, the archaeological record of Mandji shows particular cultural and socio-economic pathways, with periods of occupation in the Late Stone Age, the Early and Late Iron Age, and the colonial period; interspersed by phases of sharp demographic decline. The reasons for the colonization, abandonment and re-population of the island are not fully understood yet, but population overshoot and unsustainable exploitation of resources appear as the most likely hypotheses, owing to the fragile ecological equilibrium that is characteristic of equatorial islands. Population ceiling and sustainable productive systems are known to be key in equatorial small islands, but island-mainland connectivity and the underlying socio-historical processes have also to be considered. Here we present a multiproxy geochemical study of a chronologically well-constrained sedimentary record from Mandji. The depth variation of the elemental and isotopic composition in this paleoenvironmental record shows the signals left by each of the periods of occupation, as identified by archaeological research. These results, complemented with available paleoclimate information, report on a complex history of phases of intensification of land use, and dis-intensification and (partial) recovery of the ecological system in the interim between them. The overshoot-and-collapse hypothesis and the resilience of the successive socio-ecological systems are discussed in the light of these archaeological and paleoenvironmental results, adopting a socio-environmental approach in order to account also for the wider historical and socio-political scenarios.

18**METAPHOR & THEORY IN ISLAND ARCHAEOLOGY**

Author(s): Terrell, John (Field Museum of Natural History)

Presentation Format: Oral

The claim made more than a generation ago that islands are laboratories for studying the earth, its history, and lifeforms was always more a metaphorical notion than a scientific reality, although Dan Simberloff (Simberloff & Wilson 1969), Mark Lomolino (1984), and others back then famously tried to give substance to such an idea. Instead of continuing to debate whether islands are laboratories, therefore, it seems more telling to ask why it would be useful if they were, and why many of the metaphors archaeologists use instead in their work should be challenged and even abandoned—metaphors such as those enshrined in Vere Gordon Childe's classic statement on archaeological method and theory *Piecing Together the Past* (1956) encouraging archaeologists to see the past as a lost or broken urn we are somehow uniquely qualified to restore to functional use. Even those who see themselves solely as historians and not as scientists helping to resolve questions of broad global significance should think twice before using simple "plug & play" strategies of interpretation rather than more formal methods of plausibility analysis and statistical assessment. References: Simberloff, Daniel S., and Edward O. Wilson (1969), "Experimental zoogeography of islands: the colonization of empty islands," *Ecology* 50: 278-296. Lomolino, Mark (1984), "Immigrant selection, predation, and the distributions of *Microtus pennsylvanicus* and *Blarina brevicauda* on islands," *American Naturalist* 123: 468-483.

a.**ESTABLISHING AN ISLAND ECONOMY: CULTIVATION PRACTICES IN EARLY ICELAND**

Author(s): Mooney, Dawn Elise (Archaeological Museum, University of Stavanger)

Presentation Format: Poster

Iceland is a classic example of an 'island laboratory', and myriad studies have explored the impacts of the late 9th century Norse colonisation on the island's fragile ecosystem. An issue regularly raised in such studies is the extent to which cultivation, especially of barley, took place, and why this practice stopped. Charred barley grains, palynological evidence, ancient fields, place names and documentary sources all attest to the fact that some cultivation took place in Iceland, but there is debate surrounding whether this was sufficient to meet the demands of the population. Some scholars argue that barley cultivation was the preserve of elites, used for brewing and to signify social standing, whereas other studies suggest the mobilisation of a workforce from multiple farmsteads to produce grain for the local community. There is also limited evidence for the cultivation of flax, but this seems to only have taken place at a small scale. In the 13th century, after Iceland came under the rule of the Norwegian crown, cereal cultivation ceased. While it is often contended that this was the result of deteriorating climatic conditions, it is also probable that increased interaction with mainland Scandinavia led to a rise in the import of grain. Simultaneously, the economy of Icelandic farms became more specialised, focusing on sheep husbandry, especially for the production of woollen cloth. Fishing, particularly the production of stockfish for export, also began to become more prominent. This presentation examines how social and environmental factors combined to influence this economic change.

b. BURIAL PRACTICES DURING THE NAVIFORM PERIOD (BRONZE AGE) BASED ON THE ARCHAEOLOGICAL RECORD OF COVA DEL CAMP DEL BISBE (MALLORCA)

Author(s): Palomar Puebla, Beatriz (Independent researcher) - Valenzuela-Suau, Lua (ArqueoUIB Research Group, University of Balearic Islands) - Cardona López, Francisca (Independent researcher) - Escanilla Artigas, Nicolau (Independent researcher) - Ferré Alemany, Marc (Independent researcher) - Oliver Servera, Llorenç (ArqueoUIB Research Group, University of Balearic Islands)

Presentation Format: Poster

The Cova del Camp del Bisbe is a natural retouched cave located at the heart of the island of Mallorca (Sencelles, Balearic Islands) that was used since c. 1400 cal BC until the XX century. Even if its functionality has changed throughout time, this site was a funerary and ritual cave during the Middle and Late Naviform period (c. 1400-1100/1000 cal BC).

Archaeological remains obtained during the archeological campaigns (2013 to 2017), allow us to better understand the funerary and ritual practices carried out by this community during the Naviform period. The main goal of this research project is to obtain new data about Naviform inland communities, as most of archaeological works from this period have only been carried out in coastal areas.

The wide diversity of archaeological remains from Cova del Camp del Bisbe cave such as human bones, faunal remains, pottery, bone and African elephant ivory objects with different functionalities or an immense carbonized cereal (c. 1300 cal BC) are a breakthrough point to disentangle the social and economic organization of these communities beyond the funerary world.

This presentation will present the most relevant data that will allow us to contribute to the knowledge of this island community.

c. "LA COVA DEL CAMP DEL BISBE" (SENCELLES, MALLORCA), NEW CONTRIBUTIONS TO THE ECONOMIC STRATEGIES OF THE NAVIFORM PERIOD

Author(s): Berrocal Barber, Anna (Prehistory Department, Universitat Autònoma de Barcelona) - Palomar, Beatriz (Independent researcher) - Valenzuela, Lua (ArqueoUIB Reserch Group, Universitat de les Illes Balears)

Presentation Format: Poster

The archaeological site of Cova del Camp del Bisbe, with occupation that range from the Naviform period (Middle Bronze Age) up until recent times, is situated in the central plain of the island of Mallorca (Balearic Islands, Western Mediterranean), at the town of Sencelles, surrounded by a smooth landscape dominated by dry-land crops and pastures. Over a five year period (2013 to 2017) excavations have been carried out at the cave and a considerable volume of sediment recovered and processed, the majority deriving from sealed and well dated contexts, corresponding to c.1300 cal ANE. The flotation of the sediment has allowed a systematic sampling of different kind of bioarchaeological remains. The amount of plant macroremains recovered has offered a huge amount of seeds, constituting an exceptional archaeobotanical record to discuss Naviform economy and society. The archaeobotanical assemblage has revealed the presence of different cereal species (naked wheat, naked barley and emmer wheat), leguminous (fava bean, pea and lentil) and wild fruit (olive, fig and mastic). With such results, it is clear the relevance and level of development of the Naviform agriculture, appearing to be a key element of the Balearic Bronze Age economy, that has been traditionally underestimated in favour of a more or less specialized husbandry. Considering this exceptional archaeobotanical dataset, with this study we aim to discuss the contribution and significance of agricultural products in the Naviform diet as well as the characteristics of the agricultural production of these communities.

d. CONNECTIVITY NETWORKS OF RAW MATERIALS AND ARTIFACTS FROM THE ARCHAEOLOGICAL RECORD OF COVA DEL CAMP DEL BISBE (SENCELLES, MALLORCA)

Author(s): Valenzuela-Suau, Lua (University of the Balearic Islands) - Escanilla-Artigas, Nicolau (Independent researcher) - Palomar-Puebla, Beatriz (Independent researcher)

Presentation Format: Poster

During the recent excavations of Cova del Camp del Bisbe archaeological site, a big amount of manufactured artifacts made out of animal bone, pig and elephant ivory, sea-shells and bronze have been recovered. This set of artifacts offers a dataset suitable for the study of products and raw materials networks of circulation at different levels, both intra-island and island-mainland.

This set of biotic and abiotic materials allows us to establish circulation networks at different levels: from products that can be defined as "local commodities" because of the proximity of the raw material source and the manufacturing process, to the acquisition of foreign materials and/or objects such as elephant ivory, probably from North Africa, or tin (for bronze alloy) from West Iberia.

In this poster we present the raw-material identification and provenance study for the non-ceramic grave goods of this funerary cave, being especially relevant the case of elephant ivory. Accordingly, we will assess the origin of the different raw materials identified and the production centres through morphometric and/or chemical standardization. The main goal of this research is to contribute on the knowledge of the exchange connectivity networks and the social interactions that a Naviform community from the centre of the island developed towards the Mediterranean.

e. USE OF PLANT RESOURCES DURING THE FIRST SETTLEMENT OF FORMENTERA: ARCHAEOBOTANICAL DATA OF THE COVA DES FUM

Author(s): Carrión Marco, Yolanda (Universitat de València) - Pérez Jordà, Guillem (GI Arqueobiología, Instituto de Historia - CCHS-CSIC) - Marlasca, Ricard (Independent researcher)

Presentation Format: Poster

Cova des Fum is located 75 m. above sea level, on the cliffs of La Mola, eastern Formentera. It is a strategic place, given its limited accessibility, both from inland and from the coast, which was occupied at various periods, highlighting an occupation of the Chalcolithic and a necropolis of the Bronze Age. The cave has two sanctuary spaces, which include the presence of hearths and water management structures.

The investigations carried out in this cave are linked to the corpus of prehistoric sites of Formentera, covering some gaps of information about the pre-Phoenician settlement of the island. Although this question is sufficiently surpassed by the current literature and the first occupations date from the Bell Beaker period, there are still few paleoenvironmental data for this first settlement, despite the importance of plant resources when assessing the use of the plants, the exploitation of the territory or the settlement pattern.

We present the preliminary results of the paleobotanical study of Cova des Fum. Results point to the exploitation of a pine forest area (*Pinus halepensis*), with the presence of species adapted to rocky areas (*Pistacia terebinthus*, *Ficus carica*); the presence of *Thymelaea* is in agreement to the saline character of this environment. We also investigate the possible specific use of plants in this peculiar site.

f. LOCAL FLORA FOR FIREWOOD. CHARCOAL ANALYSIS IN COVA DES RIUETS (FORMENTERA, SPAIN)

Author(s): Badal, Ernestina (Universitat de València. Departament de Prehistòria, Arqueologia i Història Antiga) - Marlasca, Ricard (PO-SIDONIA SL.)

Presentation Format: Poster

The results of the charcoal analysis of the prehistoric site Cova des Riuets (Formentera, Spain) are presented. This cavity of karstic origin is located on the western cliff of the peninsula of La Mola, Formentera (Balearic Islands). The archaeological context corresponds to the beginnings of the Bronze Age.

Charcoals are the result of the use of wood as a domestic fuel. The firewood used in the Bronze Age at Riuets comes from local vegetation. The flora identified in the charcoals is strictly Mediterranean and evergreen, with the exception of the fig tree (*Ficus carica*), which is a deciduous tree. All the fuel has been collected in thermo-Mediterranean formations well adapted to drought and summer heat. In the set of the charcoals *Quercus* has not been identified, nor any eurosiberian or african element, in strict sense. The absence of *Quercus* (oaks, holm oaks and kermes oaks) in the charcoal assemblage of Riuets would support the hypothesis of the allochthonous character of this genus on the island as some researcher's postulate (De Bolòs, Molinier, 1984).

De Bolòs, O.; Molinier, R. 1984. Vegetation of the Pityusic Islands. En Kuhbier, alcover y Guerau d'Arellano Tur (eds.) Biogeography and ecology of the Pityusic Islands. Pp: 185-221. Dr. W. Junk Publishers.

g. APPROACHING FUNCTION AND USE OF MINOAN (BRONZE AGE CRETE) UTILITARIAN VESSELS. AN INTERDISCIPLINARY STUDY

Author(s): Tsafou, Evgenia (Aegis-INCAL, UCLouvain)

Presentation Format: Poster

Despite the varied repertoire of Minoan pottery, the specific or multi-purpose function of common pots, as well as their modes of use, remain partly enigmatic. Consequently, main aspects of Minoan everyday life and maintenance and subsistence activities remain unclear, so as the social and economic structure which underlay the organization of Minoan societies. This poster will present a current research project which focuses on the socioeconomic aspects of Minoan pottery through the examination of the function and use of utilitarian vessels. This project starts from pottery assemblages from Neopalatial and Postpalatial (1750-1200 BC) occupation at Sissi and Malia/Quartier Pi, in north-central Crete as case studies. This first-hand study is based on an interdisciplinary methodology that brings together techno-morphological analysis, use-wear analysis, organic residue analyses, archaeological contextualization and a micro-scale ethnoarchaeological study. Through this combination of methods and, specifically, the examination of vessels' contents through the use of two techniques of organic residue analysis (starch grains and lipid residues), the study focus on issues related to food preparation, cooking and consumption practices in order to reconstruct subsistence and maintenance activities of Minoan communities. Moreover, through the comparison of the results obtained from organic residue analyses with the outcome of the paleoenvironmental works conducted at the two archaeological sites, this study will provide a missing link between research on ancient landscapes and diets, on the one hand, and preparation and consumption of food, on the other. Eventually, the contextualization of the research's outcome is intended to integrate a comparative analysis that will include similar archaeological data sets from contemporary sites of other Cretan regions. In doing so, this study aims to address broader questions related to the definition of both common and distinct culinary practices and socioeconomic patterns within the organization of the Minoan society taken as a whole.

h. COLONIZING CAYO HUESO: USING MOLLUSC PALEOENVIRONMENTAL DATA TO ILLUSTRATE SMALL-ISLAND HABITATION

Author(s): Harke, Ryan (University of South Florida)

Presentation Format: Poster

Cayo Hueso (Key West) is the most remote island of the contiguous Florida Keys. Archaeologists do not know the cultural identity of its first inhabitants, nor are they certain when this tiny island was first colonized. Today, the opportunity to excavate an incipient occupation site on Key West is nonexistent, as > 99-percent of the island has been developed for residential housing, military endeavors, and tourist attractions. Therefore, the only chance to explore early lifeways on Key West is to characterize the Stock Island site, a pre-historic midden once located on a coral outcrop adjacent to the primary island. The Stock Island midden is comprised principally of aquatic fauna, including sea turtles, sharks, pelagic and coral fishes, and gastropods and bivalves. Because this zooarchaeological assemblage is primarily ecofacts (food remains), a seasonality assessment is one of the most suitable proxies to gain insight into past human use of the island. In this study, I report the only radiocarbon dates available for the Stock Island site, and perform stable isotope sclerochronology (a method analogous to dendrochronology) on modern and archaeological clam shells (*Codakia orbicularis*). These datasets yield a preliminary estimation of Key West foraging seasonality, and allow for a comparison between pre-historic and modern marine regimes surrounding the island. Establishing whether Key West was occupied year-round permits placement of the island and its peoples within regional culture schemes, and serves as an ethnological opportunity to Southeast US cultures with extralocal Caribbean peoples and other small-island societies across the globe.

397 MODELLING THE PAST: CRISIS OF IDEAS IN MODERN ARCHAEOLOGY?

Theme: Theories and methods in archaeological sciences

Organisers: Nakoinz, Oliver (Institut für Ur- und Frühgeschichte, Christian-Albrechts-Universität, Kiel; Johanna-Mestorf Academy, Kiel) - Diachenko, Aleksandr (Institute of Archaeology of the National Academy of Sciences of Ukraine) - Kadrow, Slawomir (Institute of Archaeology, University of Rzeszow) - Girotto, Chiara (Goethe University Frankfurt) - Rivers, Ray (Imperial College London)

Format: Regular session

Currently a range of coexisting paradigms and growing importance of behavioural research has replaced the epoch of paradigm wars in archaeological theory. This variability and eclectic choice, sometimes seen as “anything goes” can be understood as a bifurcation point identifying the deep crisis of ideas in archaeology.

However, a crisis also signifies the emergence of new solutions. Due to its integrative power modelling has gained extraordinary significance in the forming of new syntheses. However, especially in the light of highly theoretic environmentally driven, Darwinian like models, devoid of cognitive human factors, fuzzy decision making, and the possibility of non-rational choice they provide a very biased approach. Considering all implemented assumptions required for social interaction models we have to question whether a model might be too complex to operate on the basis of our data.

Significant questions are:

- Is there any empirical evidence that cannot be explained from the perspective of any paradigm?
- How are narratives encoded in models, as discussed from a theoretical, methodological or practical viewpoint?
- Are we creating Processualism 2.0?
- How does the inclusion of social theory alter the results from a model?
- Do we lack important approaches or getting lost in multiple meanings?
- To what extent is the crisis of ideas caused by education in archaeology and the organization of the academic system?
- Does the specific role of archaeology in-between science and humanities affect the assumed crisis and the lead to biased modelling approaches?

ABSTRACTS

01 IMPLEMENTATION ARCHAEOLOGY

Author(s): Zubrow, Ezra (University at Buffalo; University of Toronto)

Presentation Format: Oral

Archaeology is a mature field. It has moved through a series of theoretical paradigms---dilettantism, classification, time-space systematics, processualism, post processualism and evidence based.

This paper considers how archaeology should be reconfigured implementing research into practice, understanding and explaining what influences implementation outcomes, and evaluating implementation strategies. We know there is considerable overlap

among these paradigms for the commonalities allow previous theories, methodologies and most importantly data to be utilized by more recent paradigms as well as make it possible to facilitate the selection of relevant approaches. There must be sufficient detail for guiding the implementation process.

The session Organisers propose “the epoch of paradigm wars is over.” Implementation theory suggests that not only is there a range of coexisting paradigms but “the epoch of integration has begun”. Furthermore, multiple meanings are disarticulated and disaggregated by implementation theory. Simultaneously implementation theory also dismisses the concept of “anything goes”. “Anything goes” has no place in a synthesis or an integration.

Case studies are taken from archaeology under crisis. This study uses theory, methodologies, and data from archaeological projects impacted by twentieth century terrorism. Implementation theory suggests that there need to be new theories regarding archaeological research and heritage, new methodologies regarding survey and excavation, and new ways of recording data. Ultimately, implementation theory suggests archaeology needs to take a new role in social policy.

02 THE PROBABILITIES OF ARCHAEOLOGICAL EXPLANATION

Author(s): Barceló, Juan (Universitat Autònoma de Barcelona)

Presentation Format: Oral

What distinguishes Archaeology from purely laboratory sciences is its inability to know with near certainty the sequence of events that led to the complexity we see today in the present at the archaeological site. Archaeological explanation is first always uncertain because some indeterminacy may appear between actions of human activity and the visual and material properties of the preserved remains of such an activity.

Although uncertainty has long been recognized as being important in archaeology, it is still a problematic issue. It is not always clear what the term means, how it should be discussed, used, and measured, what its implications are.

In this paper, I argue that archaeologists, as most social scientist, should adopt a probabilistic view to explanation. In agreement with the most habitual definition of probability, we could affirm, then, that a causal event would exhibit some degree of regularity when more characteristics are “frequent”, and fewer characteristics are “infrequent” in the known series of observed events.

Consequently, we should think about social activity in the past in terms of social dispositions or capacities within a system of subjects, intentions, activities, actions and operations, some of them rational, others clearly indeterminate, impulsive or unconscious. The fact that the performance of some social action A, in circumstances T, has a probability P of causing a change Y in some entity N (social agent, community of social agents or the nature itself), is a property of the social action A. It is a measurement of the intensity of the propensity, tendency, or inclination of certain events to appear in determined causal circumstances.

03 THE ENTROPY OF ARCHAEOLOGICAL THOUGHT

Author(s): Diachenko, Aleksandr (Institute of Archaeology of the NAS of Ukraine) - Sobkowiak-Tabaka, Iwona (Ośrodek Studiów Pradziejowych i Średniowiecznych, Instytut Archeologii i Etnologii PAN)

Presentation Format: Oral

Each discipline has its ‘good’ and ‘hard’ times. But what does ‘good’ or ‘hard’ mean quantitatively? If many solutions to a single archaeological research issue are possible within different paradigms, then how the quantity of these solutions impact the overall explanatory capacity of the discipline? How different perspectives on a single issue influence uncertain answers to research questions and raise active discussions? How coexisting and ‘overlapping’ paradigms effect interpretations and explanations? Is a deep synthesis of current paradigms an achievable goal and, if so, what are the further trajectories of the development of archaeological method and theory?

Applying information theory to a history of archaeological thought, we aim to estimate the entropy of theoretical archaeology providing quantitative solutions to what is often called ‘crisis’ or ‘progress’. Further on, this issue is scaled to the taxonomy and meaning of ‘archaeological culture’ within different paradigms. Concerning similarity and diversity of materials distributed across large territories exemplified by Federmesser data from the North European Plain, we test the potential of information theory in explanation of simultaneous unification and differentiation of archaeological ‘cultural units’ and culture change. Complementary to the analysis of entropy in archaeological thought, the obtained results lead to reframing of ‘archaeological culture’ as one of the cornerstone concepts of the discipline.

04 LOOKING BACK TWICE - THE FUTURE OF ARCHAEOLOGICAL THEORY

Author(s): Nakoinz, Oliver (Johanna-Mestorf Academy)

Presentation Format: Oral

“Why should I bother to come up with a valid archaeological theory? The content of archaeological theories is arbitrary and each theory will become obsolete with the arrival of the next completely unrelated one during the process of a paradigm shift. Each strange idea is good as long as it is new and does not agree with previous ones. Anyhow, science is a social business and the only thing which matters is the support by others, in particular with de-constructing the previous dominating theories.”

It seems the attitude described in these sentences is rather popular today. After the last big paradigm of archaeological theory and

the war of theories came the age of arbitrariness and a multitude of assumed paradigms. This age leaves us with many theories assumed to be unrelated and incommensurable according to Kuhn. Now we have to face, that most assumed paradigm shifts are not paradigm shifts *sensu* Kuhn but do complement each other.

The new era of archaeological theory hence is bound to focus on integration and comprises the integration of old with new ideas, the re-contextualisation of old ideas and the integration of quantitative modelling and hermeneutic narratives. Archaeology lives in-between science and humanities and hence, both, the recovery of data inherent structures and developing a narrative base on hermeneutics are complementary approaches.

The required integration and the look back not only into prehistory but also into the history of research is not only a kind of consolidation but also provides us with a synthesis based on a new concept of scientific research and with untrodden paths of archaeological interpretation. This concept of research is different from the one which leads to the war of theories and the inflation of assumed paradigm shifts.

05 ON THE EDGE OF METAMODERNITY? ‘THIRD WAY’-EPISTEMOLOGIES IN ARCHAEOLOGY

Author(s): Heitz, Caroline (University of Bern, Institute of Archaeological Sciences)

Presentation Format: Oral

Has archaeology drifted into a crisis of ideas? Or is the current mood rather a symptom of metamodernity in the making? While processual archaeology drew basically on modernity's realism, it was postmodernity's constructivism and relativism that informed postprocessual archaeology. However, recent epistemological developments like the so-called material, science and digital turn seem to challenge the postmodern thought: There is certainly a danger of turning (back) to naive realism and (new) processualism. Furthermore, the combining of qualitative and quantitative methods from science and humanities can lead to mixing contradicting stances, if epistemological approaches are not carefully chosen.

In my view, these developments should be reflected in a broader societal context of global phenomena summarized in keywords like resource scarcity, pollution, climate change, big data, AI, the internet of things. With reference to art and culture, it was proposed that such real-world problems led to the dawn of yet another condition of society or even epoch: post-post- or metamodernity (e.g. Vermeulen and van den Akker 2010; Gibson 2017), characterised by stances between and beyond modernism and postmodernism, idealism and materialism, realism and relativism etc. Although such a provocative view might be contentious, its synthetic tendency is intriguing. In archaeology as well, ‘third way’-epistemologies – as I call them – are being increasingly discussed: by drawing on e.g. the praxeology of P. Bourdieu, critical realism of R. Bhaskar or the pragmatism of C. S. Peirce. I would like to probe into some of them regarding their potential for the current inter-/transdisciplinary tendencies in archaeology.

06 ARE WE CREATING OUR PAST? – REFLECTIONS ON BEHAVIOURAL MODELLING

Author(s): Girotto, Chiara (Goethe University Frankfurt)

Presentation Format: Oral

Social interactions and structure have become a pivotal field of archaeological behavioural modelling. While having fully embraced approaches of “eclectic theory” many associated questions remain – in their very nature – post-processual. Social interactions and structures are cognitive features of society, subjective, and often symbolic. In pre- and protohistory direct and objectively interpretable evidence is missing. Instead research is based on traces acquired through material remains, settlement patterns, the environment, and human remains. Whilst the use of environmental and spatial data might seem more objective than those derived from material culture it faces the same critique as a processual approach. Modelling based on such indirect evidence will not only encode the modeller's perceptions on the meaning of features but also the intrinsic assumption of the applied algorithm. Often the complexity of human behaviour is reduced to linear models, driven by game theory and economic as well as environmental determinism.

This theoretical paper aims to investigate the current archaeological approach to modelling and questions, whether we are not ourselves creating a narrative of the past. How can we combine objective and interpretative approaches to reach better approximations of past societies? How can we extract matterful variables without a priori assumptions from indirect evidence?

07 SHADOWS OF A PAST AS WISHED FOR: HUMAN NATURE, STARTING ASSUMPTIONS, AND THE PROBLEM OF BEHAVIOURAL UNIFORMITARIANISM IN ARCHAEOLOGY

Author(s): Taylor, Timothy (University of Vienna; Journal of World Prehistory)

Presentation Format: Oral

This paper investigates dilemmas arising from the unavoidable presence of both the sociological paradigm and ethnographic analogy in the way past behaviour is inferred from archaeological remains. These are effective and powerful default assumptions against which evidence is seen to have to accrue (often for no logical reason and sometimes counter-intuitively). Following this, implications for the way in which parsimony in archaeological inference can best operate are identified.

This paper focuses on what can be termed ‘tacit starting points’ by using specific examples that highlight the different approaches taken to the potential theme of custom cannibalism in past cultures, where different periods, phases and national schools of scholarship have used different kinds of plausibility thresholds for the variant potential kinds of cannibalism (endo-, exo-, medical-, survival-, gustatory, criminal/psychotic-, accidental-, etc.).

Taking the view that only pluralist styles of explanation have long term resilience and that archaeology must always have some level of transdisciplinarity, this paper delineates the polar-extreme positions of Arens and Rocher (anthropologically-based custom-cannibalism denial) on the one hand, and the epidemiological inferences of Collinge et al. (genetic PRNP haplotype diversity data indicates a strong selection pressure explicable only by positing frequent past endocannibalism) on the other. Given better reasons for accepting the latter than the former, no middle ground need be sought, thus the presence of custom cannibalism should be tacitly assumed as the starting position against which contrary archaeological, osteological, and other evidence must be brought.

08 ON THE CONCEPTS OF POWER AND VIOLENCE

Author(s): Arponen, VPJ (Institut fuer Ur- und Fruehgeschichte Kiel)

Presentation Format: Oral

This paper contributes to the session topics concerning the relationship of theory to empirical evidence on the one hand, and the question of culture or group formation considered as a question of power and violence on the other.

Regarding the question of empirical evidence, drawing from the tradition of Kantian philosophy, theory can be understood as a matrix or lens through which empirical evidence is viewed and organized. From the Kantian perspective, there can be no theory-less observation. By contrast, there is a wide-spread tendency (in archaeology and elsewhere) to assume that empirical evidence should, so to speak, give rise to its own interpretation without recourse to non-objective theory mirroring our ideal of a good, impartial science as that of neutral observation and recording of facts without interpretation. The situation is made even more difficult for theory by the fact that natural languages (such as English) do not differentiate between different senses of error: illogical reasoning, careless or faulty observation, and error as deriving from the use of an unsuitable matrix or lens. Rather, the use of a matrix is easily conflated with empirical or logical error –but is not necessarily neither. Such differentiations are important to make and can serve as a basis for understanding how matrix-based science can still be good, error-free, science.

I illustrate the significance of the above by discussing the concepts of power and violence. It will be argued that theory is absolutely needed to understand the character and role of power and violence in prehistory. Anthropological analogies invite interesting considerations about how power and violence might have worked in the past, yet our modern concept of power and violence might serve to distort our understanding. This contribution will contrast heterarchical and network theories of power with hierarchical and exclusionist forms often favored in archaeology.

09 IS THE PAST THE SAME AS THE PRESENT?

Author(s): Rivers, Ray - Evans, Tim (Imperial College London)

Presentation Format: Oral

Theoretical archaeological network modelling, particularly for historical exchange networks and city-state formation, often adopts contemporary socioeconomic ideas whose C20 language gets translated into historical behaviour with the simplest of lexicons, suggesting an inappropriate ontology which can lead to the impression that the past is like the present. Recent examples include a Ricardian analysis of BA Assyrian trade routes assuming iceberg no-arbitrage ad valorem transaction costs following a Weibull distribution in a framework of Constant Elasticity of Substitution [1]. That paper exploits the archaeological record well, is nuanced in its analysis and clever in its conclusions, but such seeming reinvention of systems theory runs counter to recent developments in archaeology. As a result, network theory modelling has not been widely accepted as a valid way to proceed despite further successful applications e.g. in describing state formation in situations from Latenian Gaul to the Bronze Age Near East adopting an approach originally designed for the organisation of C20 shopping malls.

Our intention in this talk is to strip out as much of the contemporary context as possible, to bring modelling back to basic epistemic propositions (e.g. Jaynes' 'maximum ignorance' or 'epistemic modesty'). The idea is that although the ontology may be specific to contemporary society the epistemology has much greater generality, while leading to essentially the same conclusions. The authors of [1] and elsewhere are aware of this but we shall be explicit in taking one step back to express results in language that recasts the models as an interrogation of our knowledge without the need to invoke agents directly.

1. Gojko Barjamovic, Thomas Chaney, Kerem A. Cosar, Ali Hortasu; "Trade, Merchants, and the Lost Cities of the Bronze Age", NBER Working Paper No. 23992, November 2017 NBER Program(s):International Trade and Investment.

10 PEACE, JOY AND PANCAKES? THE ACTUAL STATE OF GENDER ARCHAEOLOGY

Author(s): Koch, Julia Katharina (Kiel University)

Presentation Format: Oral

Nearly thirty years of gender archaeology and feminism in archaeology in Europe has changed some within our academic world and projects. After the starting time with discussions in closed female groups inside and outside of universities and some rare publications the interesting on questions about gender roles, identities and differentiation in the past raised more and more. Meanwhile we have reached a lot: an international network under the umbrella of the EAA, some national groups with or without formal structures like in Spain or in Germany and a few gender related projects funded by national or European grants. Gender archaeology (and a little bit feminism) seems to be accepted by archaeologists as part of the whole theoretical building for researching the past. Is that the point, we don't need any longer struggle for our gendered research subjects and ideas? But since some years the backlash against

feminism and women movement grew up in Europe and reached also Gender Archaeology, boosted by social media. What does such negative rating mean for gender researcher and for the archaeological community? Would be this backlash a problem of a small group within the Archaeologies or is it only one symptom of similar handlings with all academic institutions especially by right-leaning populism?

11 GERMAN ARCHAEOLOGY AND INTEGRATIVE RESEARCH: REFLECTIONS ON DEVELOPING COLLABORATIVE RESEARCH PROJECTS

Author(s): Hofmann, Kerstin (RGK - Romano-Germanic Commission DAI)

Presentation Format: Oral

German Archaeology has long been understood as generally uninterested in theory. Apart from individual scholars with a great interest in archaeological theory, some of whom created, with the Theorie-AG founded in 1990, a communication platform, the growing number of interdisciplinary collaborative research projects in Germany since the new millennium has been a crucial factor for the further development of theoretical approaches. This was, and is, often considered to be the most appropriate way of escaping the general decline of the small university disciplines. The necessity of integrating clear theoretical and methodological approaches into successful proposals and the subsequent research, changed the significance of theoretical discussions. As a consequence, theme-oriented research has developed which aims at addressing overarching socially relevant topics. The most prominent themes in German Archaeology are self-reflexivity in a research historical context, identities and social differentiation, space, cultural encounter and knowledge transfer. Even if the topics are similar to the British and American theoretical discussion, due to the historical and intellectual background, as well as the language, there are numerous differences between these research traditions which are worth considering.

Given the plethora and diversity of approaches and methods in the still burgeoning field of archaeology it is crucial to trace the travelling and translation of concepts and practices across various disciplinary, historical and national contexts and to map their transfer and transformations. The engagement with travelling concepts and practices might help to reveal similarities, differences and tensions between different usages and, in doing so, establish links within the increasingly diversified field of the study of human mankind. Such an endeavour can also introduce a new self-reflexive dimension, illuminate 'blind spots' in our research and so affect our own theorising.

12 NEW TRACEOLOGY, MORPHOTRACOGENESIS THEORY, AND THE EARTH'S ARCHAEOSPHERE

Author(s): Pankovskyi, Valentyn (Institute of Archaeology Ukrainian Academy of Sciences - Kyiv)

Presentation Format: Oral

The New Traceology is a set of postulates derived by the author from some current developments in the fields of archaeological traceology and flint knapping technology analysis as well (Girya 2015; 2017). These regulations were transformed by the author of the paper into the morphotracogenesis theory in archaeology. According to this conception, the processes of shape and trace (marks, modifications, etc.) formation in artefacts may seem to compose a combinations of actions of operational conditionality which may appear from micro levels to mega levels in the whole archaeological oecumene with changing raw material's own shape and modifying it's own surface. The raw material modifications of this kind are usually resulted in the form of traces and residues of various scales from tiniest to gigantic. The next thesis is that the morphotracogenesis may be integrated into the universum model of archaeological procedure (Bochkarev 1975) and, at the same time, it seems to fit the ideas concerning the culture-to-nature essence of archaeological deposits (Bochkarev 2014). Hence, a new archaeological concept of the Earth's archaeosphere (not so much geoarchaeological as it goes from Edgeworth et al. 2015) is put forward to promote new visions for the very essence and structure of modern archaeological cognition.

13 MODELING OF LANDSCAPE EXPLOITATION IN THE MEDIEVAL TRANS-URALS

Author(s): Matveeva, Natalia - Tret'yakov, Yeugeniy (Tyumen state university)

Presentation Format: Oral

Modeling of landscape exploitation reflects of sustenance. The reconstruction of the medieval groups' economic activity is able in analyzing type of breeding, climatic and social conditions of the I millennium AD. The investigation was based on data about dwellings, implement and zoology collections of Kolovskoye settlement in the forest-steppe Trans-Urals.

Basing on the central place theory and results of mapping the region, where archaeological complexes are located at the distance of 30-40 km along the rivers, we suppose that Bakalskaya culture's settlements were economic centers. This fortified settlement with subordinated Krasnogorskoye settlement and four open settlements were interpreted as a center of territory development and appropriation. Its area included different districts depended on number of common (50-200), herd's composition, level of social stratification and pattern of military threats.

By model 1 early medieval common could practice semi-settled type of breeding with 30 % of cattle in livestock, appropriating economy. The cattle was at grass and was keeping in small woods in floodplain. Model 2 supposes complex hard-stratified society in Middle Ages. In this model aristocratic class had semi-nomadic type of breeding and ordinary population had semi-settled type of breeding based on horse-breeding and sheep-breeding, beginning of agriculture, appropriating branches of economy. Aristocracy

had most of cattle and grazed them on winter pasture in steppe area. Inhabitation of Bakalskaya culture's population and nomads of Kazakhstan in the same ecological niche (basing on data of several cemeteries) confirms alternating resettlement different ethnic populations in the forest-steppe and the steppe, which they managed seasonally.

The authors definite this models as hypothetical versions on the economic dynamics in the settlement's areas depending on the state of the environment, complication social stratification.

14 HOW DO I MODEL URBAN MOVEMENT?

Author(s): Crawford, Katherine (University of Southampton)

Presentation Format: Oral

The study of ancient movement on the urban scale has seen increased interest in recent years. The predominant approach remains the application of space syntax methodologies as a way to question how a city's street network promoted urban movement patterns. Additional methods arising out of the field of urban studies, however, are providing fruitful new avenues of research for the study of pedestrian movement that moves beyond a focus upon a city's street design. In particular, the integration of network science and agent-based modelling provides a venue for questioning what urban and social factors affected different forms of pedestrian movement within the ancient cityscape. In this paper I address how ritual movement, a specific form of pedestrian movement, can be modelled and analysed in the ancient city of Ostia, Rome's ancient port. The application of both urban network analysis and agent-based modelling presents an innovative approach for studying how potential areas of ritual movement were structured by the built environment and various forms of social activity. In particular, I challenge the results and question the extent to which these models can inform our understanding of past ritual movement patterns. By questioning our assumptions and theories related to urban movement, we can begin to address topics that remain invisible within the archaeological record.

399 CULTURE CONTACT IN THE GREEK MEDITERRANEAN

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Kyle, Britney (University of Northern Colorado) - Reitsema, Laurie (University of Georgia) - Saltini Semerari, Giulia (Eberhard Karls Universität Tübingen)

Format: Regular session

Beginning in the 8th century BCE, Greek colonists settled throughout the Mediterranean, resulting in movements of people, goods and ideas across vast geographic space. This phenomenon took place at a time of intensified exchanges, and itself served as catalyst for the multiplication of spaces of interaction. The establishment of Greek colonies resulted in new social and intercultural dynamics that had a deep impact on colonists and local populations, changing the demographic and socioeconomic makeup of the Mediterranean. The interpretation of this wide-ranging process sparked a lively debate over the origin of colonizers, their interaction with local populations, and the relationship between Greek colonization and processes of ethnogenesis (the process of crystallization of identities based on common ancestral, social, or cultural experience) that developed in its wake. Thus far, these issues have been largely addressed using material culture and historical sources. This session explores the significant contributions being made by a powerful complementary source of information: bioarchaeological data. More specifically, by fostering communications between archaeological and bioarchaeological researchers, we aim to disentangle the relationship between constructed identities (evidenced by material culture, burial style, etc.) and biological identity (determined using biodistance analysis, aDNA evidence, etc.) at this time of profound social and political change in European history. By exploring the deep roots and biological and cultural dimensions of interactions between diverse populations, this session is especially relevant today as renewed emphasis on ethnic delineation clashes with ever-increasing human mobility across a globalized world.

ABSTRACTS

01 THE IMPACT OF BECOMING A COLONY: A BIOARCHAEOLOGICAL STUDY OF RESILIENCE AND ADAPTATION IN NORTHERN AEGEAN POPULATIONS (8TH-5TH C. BC)

Author(s): Zisis, Anastasios - Vika, Efrossini - Papageorgopoulou, Christina (Democritus University of Thrace)

Presentation Format: Oral

Greek colonisation (8th -5th c. BC) was a dynamic historical process with social, economic, and demographic projections that changed the image of the Mediterranean and Black Sea in terms of culture, society, economy and human biology. Plenty of historical and archaeological studies outline the patterns that were followed during the phenomenon of colonisation. However, several questions remain, including the relationship between the colonists, the mother cities and the indigenous populations, as reflected on demography (e.g. population size, mortality rates, intermarriages), health, diet, and activity patterns. The area of Northern Greece counts more than 100 colonies but, thus far, remains understudied through a bioarchaeological perspective. In this paper, we propose an inter-disciplinary approach to the study of resilience and adaptation of past populations, triggered by the process of

colonisation. We focus on four colonies located at the littoral of Northern Aegean, Zane, Abdera, Dikaia, Acanthus. They all received heterogeneous cultural influences and flourished economically, mostly due to their busy ports, and their involvement in the transport and commercialisation of goods from the mainland. Our study focuses on the living conditions of the first colonists through the macroscopic and microscopic osteological examination combined with isotopic signatures of carbon, nitrogen and sulphur. All sites count numerous skeletons, making them a unique ground for palaeodemographic and biological adaptation studies.

02 PROJECT AMICI: BIOLOGICAL AND CONSTRUCTED IDENTITIES IN THE GULF OF TARANTO

Author(s): Saltini Semerari, Giulia (Eberhard Karls Universiteit Tübingen)

Presentation Format: Oral

The Gulf of Taranto was a key area of culture contact during the Greek colonization, as evidenced by important archaeological finds across the region: for the period spanning the end of the 8th to the 6th century BC, both inland sites like Incoronata and Santa Maria d'Anglona and colonial sites like Siris and Metaponto have produced contexts with 'mixed' material culture originated locally and in Greece. But interpretations of these contexts has been hotly debated, with researchers arguing both against and in favor of co-existence between local indigenous populations and Aegean newcomers. In this paper, I provide a critical reassessment of a four-year project that combined comprehensive osteological analyses of both indigenous and colonial sites in the region with the analysis of grave good assemblages and other archaeological indicators. The aim of the project was to establish patterns of admixture between local population and Aegean newcomers, and to test how these results compared with the collective and individual identities as expressed through material culture in the region. In particular, here I focus on one of the main methodological and theoretical issues raised by the project, namely the combination of information drawn from osteoarchaeological evidence, which includes static data concerning sex, age, and biological relatedness, with the more fluid conception of constructed gender and ethnic identities as defined by recent scholarship. Finally, I address the limits and potential of this approach with a view to its broader Mediterranean significance.

03 PUTTING OUR HEADS TOGETHER: CRANIAL NONMETRIC TRAITS AND RELATEDNESS IN GREEK SICILY

Author(s): Sulosky Weaver, Carrie (University of Pittsburgh)

Presentation Format: Oral

Genetic and environmental factors, as well as habitual activity, cause the development of skeletal anomalies called 'nonmetric traits.' Although they have been used to strengthen claims of genetic relationships within cemeteries (e.g., identifying family plots), nonmetric traits are most successfully utilized to determine biological affinities among population groups (i.e., which population groups are the most closely related). This paper presents a study of nonmetric cranial traits observed in a skeletal population from the Passo Marinaro necropolis at the Sicilian Greek polis of Kamarina (ca. 5th to 3rd c. B.C.). Thirty nonmetric cranial traits were examined on 200 extant crania. The frequencies of these traits were then compared via multivariate statistical analysis to those of various populations from Sicily (local non-Greek sites: Castiglione, Cefalù, Thapsos, Plemmyrion, Monte Casaia and Greek sites: Syracuse, Morgantina, Carlentini, Leontinoi, Piscitello), southern Italy (a Greek site: Metaponto), and outlier populations from Pompeii (a Roman site) and Mycenae (Grave Circle A). The statistical analysis, an optimal scaling test, separated the populations into two groups that correspond to ethnicity, namely Greek and non-Greek. As a result, this study demonstrates that the analysis of nonmetric cranial traits allows, in general, for the successful grouping of populations according to ethnicity and site type.

04 STATUS AND REPRESENTATION IN EARLY ARCHAIC MYLAI

Author(s): Buckingham, Emma (The University of North Carolina at Chapel Hill)

Presentation Format: Oral

This paper reanalyzes the Archaic tombs in the Southern Necropolis at Mylai in northeast Sicily to determine what assemblages of grave goods, tomb typology, and visual aspects, can tell us about the expression of ethnic and social identities of those interred in a cemetery.

Burial practices at Mylai have until now been examined primarily from the Chalkidian Greek viewpoint, given the origin of the colony's members; tomb typologies have been considered part of the "Euboeo-Cycladic" koine characterizing a number of settlements established by Euboeans. Yet the Mylai burials, mainly cremations in plain vessels with few grave goods, are dissimilar from Chalkidian burials elsewhere in the West, despite cremation at a number of those sites. In fact, sustained indigenous presence at the cemetery, located in the same area as earlier indigenous graves, is suggested by fibulae in several tombs and indigenous coarseware ceramics used as cremation urns. In these contexts, it is not ethnic identity, but rather social status, signaled by both continued signs of indigeneity and the relative quality of the few imported grave goods, that is likely most at play.

While Greek settlers in the area indeed used preexisting networks linked by routes controlled by numerous hilltop settlements, local customs were far from erased; indeed a number of burial types and vessel forms seem comparable to earlier Ausonian types derived from mainland Italic culture. The primary type of burial – cremation – is also established in indigenous contexts, especially in indigenous Sikel territory in northern Sicily, tied to mainland Italian tradition. This continuity of indigenous burial traditions side by side with use of valuable imported Greek items suggests that local elites employed both as status markers; indeed the traditional forms appear to be the more important aspect, suggesting a trajectory emphasizing indigeneity as a marker of local elite status.

05 EXPLORING BIOLOGICAL AND CULTURAL IDENTITY AT THE GREEK COLONY OF HIMERA (SICILY) USING NONMETRIC DENTAL VARIATION

Author(s): Kyle, Britney (University of Northern Colorado) - Poston, Alexander (Reed College)

Presentation Format: Oral

The Greek colony of Himera was an intersection for indigenous Sicilians, Euboean colonizers, and Corinthian-descended Syracusans, among others. This study investigates relationships between biological ancestry and cultural expression by examining flexed burials and a cappuccina graves. In other contexts, flexed burials are associated with indigenous Sicilians, while a cappuccina-style burial began as a mainland Greek custom. We test the null hypothesis of no biological difference between a cappuccina and flexed burials. Variation in 24 nonmetric dental traits was used to identify genetic relatedness between Himeran a cappuccina (n=264) and flexed burials (n=19). These Himeran samples were then compared with data from Karystos (n=84, on Euboea) and Corinth (n=43), to see if a cappuccina burials are more closely related to individuals from mainland Greece. Pseudo-Mahalanobis' D2 and logistic regression analyses estimated that Himeran a cappuccina and flexed samples were more closely related to each other than to Karystos or Corinth. However, low phenotypic diversity among all four groups suggests that all are genetically similar. Similarity between the Himeran samples suggests the possibility that biological ancestry was not a primary factor in the Himerans' conception of cultural identity, and decisions about how to bury the dead. Alternatively, gene flow between a variety of peoples from throughout the Mediterranean could have created a Himeran population that was no longer strictly Greek. We tentatively contrast this pattern with other parts of the Greek world, including Classical Athens, where citizens were described as discriminating along biological lines to strengthen Athenian identity against other city-states. Our data suggest that complex relationships existed between historical circumstances and ethnicity formation in ancient Greece.

This research was funded by the National Science Foundation Research Experience for Undergraduates award numbers 1560227 and 1560158, the University of Georgia, and the University of Northern Colorado.

06 THE GREEK COLONY OF HIMERA, A PLACE OF CONTACT AND CROSSROADS OF DIFFERENT CULTURES AND PEOPLES

Author(s): Vassallo, Stefano (Soprintendenza di Palermo)

Presentation Format: Oral

Himera, a colony founded in 648 and destroyed in 409 BC by Greeks of different origins, Chalkidians and Dorics, was the only colony on the Sicilian Tyrrhenian coast; moreover, it was also the closest Greek city to Palermo and Solunto, a Punic emporium, and was in contact with a vast hinterland occupied by Sicilian indigenous peoples.

Although Himera was always politically and culturally a Greek city, its singular position, at the centre of networks of commerce and people's passage, represented a significant peculiarity that undoubtedly contributed to define its specific characteristics compared to other Sicilian poleis. There is no coincidence that in front of the city walls, in 480 BC, a great battle took place between the Greeks of Himera, Agrigento and Syracuse and the Carthaginians for the domination of the island; a war that was also a clash between different cultures, so much that the Greeks themselves celebrated it as a triumph over the "barbarians", that is, on non-Greek peoples. Anthropological investigations carried out on a large sample of skeletons, including those who fell in the battles of 480 and 409 BC, could be an interesting element to understand possible differences in characters of the Imerese population. The archaeological research carried out in recent years in the inhabited area and in the necropolis are returning an interesting body of materials that reflects the broad spectrum of commercial and economic interests of Himera, documenting passages of goods, both along maritime routes and with the Sicilian hinterland.

The paper will provide an updated picture of these data highlighting the many contributions that found Himera a connective tissue that is the foundation of the cultural life of the city.

07 DIET AND DIVERSITY AT THE ANCIENT GREEK COLONY, HIMERA (648 - 409 BCE)

Author(s): Reitsema, Laurie - Reinberger, Katherine (University of Georgia)

Presentation Format: Oral

The Greek colony of Himera was founded on the northern coast of Sicily in 648 BCE. Its position at the intersection of two major land routes and with direct access to sea exchange routes afforded the opportunity for connections between the Phoenician and Greek colonial powers on Sicily, the indigenous populations, and other trading populations such as the Etruscans from mainland Italy. This cultural hotbed provides an important case study to investigate multiculturalism within a community, what diet was like in the Greek Mediterranean more broadly, and the lived experiences of individuals at colonies.

This paper will use isotopic analysis to look at the relationship between constructed and biological identities at Himera through diet (carbon and nitrogen isotope ratios: $\delta^{13}C$, $\delta^{15}N$) and place of origin (oxygen and strontium isotope ratios, $\delta^{18}O$, $^{87}Sr/^{86}Sr$). Bone collagen samples were measured for $\delta^{13}C$ and $\delta^{15}N$ (N=60) and tooth samples were measured for $\delta^{13}C$, $\delta^{18}O$ (N=134) and $^{87}Sr/^{86}Sr$ (N=66). Preliminary data suggests large variation in diet among individuals who lived at the colony of Himera and many places of geographic origin. We explore the extent to which biological (e.g., sex, age) and cultural (e.g., burial style and context) factors explain these variations, and compare Himera to other Greek colony and Mediterranean sites. Diet and place of origin influence and are influenced by cultural identity, allowing bioarchaeologists to utilize isotopic data to understand cultural dynamics in the past.

08 AN ISOTOPE-BASED APPROACH TO RECONSTRUCTING THE DYNAMICS OF ANCIENT GREEK LIFEWAYS

Author(s): Fernandes, Ricardo (Max Planck Institute for the Science of Human History; McDonald Institute for Archaeological Research) - Saelles, Kevin (Université Libre de Bruxelles, Research Univ of Anthropology and Human Genetics; Université de Bordeaux, CNRS, UMR 5199: "PACEA - De la Préhistoire à l'Actuel: Culture)

Presentation Format: Oral

The ancient Greek world emerged during the Bronze Age and was part of a network of cultures intertwined within the Mediterranean region. Its development was determined by multiple causes but heavily influenced by close interactions with the peoples and cultures of Europe, Asia, and Africa.

Ancient Greek political and social dynamics have been primarily studied using written sources but also increasingly from the scientific analysis of archaeological materials. In this respect, important insights may be obtained by exploring the relationships between the reconstructed lifeways (e.g. dietary intakes, nutritional status, and mobility) of ancient Greek individuals and social, political, economic, environmental, and cultural parameters. Such lifeways can be reconstructed through multiple isotopic analyses of human, faunal, and botanical archaeological remains and there is a growing body of isotopic evidence for the ancient Greek world. Available ancient Greek isotopic data has now been centralized in the IsoArch database (<http://www.isoarch.eu>). IsoArch is part of the global partner-based initiative IsoMemo (<http://www.isomemo.com>) which brings together large scale repositories of archaeological, ecological, environmental, chronological data. Following an integrated Bayesian statistical approach that promotes interdisciplinarity accumulated isotopic evidence was combined with other forms of non-isotopic data on diet, mobility, and chronology (e.g. archaeo-botanical or -faunal studies, human osteological studies). The outcome of the Bayesian statistical analysis allowed for the reconstruction of the temporal and spatial diversity of ancient Greek lifeways.

09 EASTERN FEATURES IN THE ELEMENTS OF THE ARCHAIC BOSPORUS. NEW RESEARCH

Author(s): Rukavishnikova, Irina (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

This study is devoted to a new attempt of understanding the cultural connections in the contact zone of the margins of the Greek world - the Northern Black Sea colonies and nomadic communities. Analysis of the existing hypothesis about the eastern origin of the remarkable and functional horse equipment, weapons, and decorations. New data from excavations of the Arzhan-5 mound in Central Asia allow to provide a new analysis of similar objects and funeral complexes in the archaic culture of the Ancient Bosphorus.

The ancient variant of curdled predator image, complex and multifaceted symbol developed in the East.

The specific set of animal images is the bestiary of the areas or adopted from other regions. Animals are often depicted with such realistic details, that allows to recognize the species. The composition of the images, or the pose portrayed the essence. In the early stages of animal style composition this is the decorative way to portray space. First of all - it's multi-figure compositions, "Mysterious images."

Archaic societies on the Bosphorus perceived the elements of material culture through contact zones, reproducing both figurative elements and style. The archaic complex of Temir Mountain includes figurative elements close to Eastern analogies. Having perceived the idea of curtailed predator, the Ancient Bosphorus masters decorate weapons and horses with this symbol, as in nomadic societies, despite the existing antique style. This "Mysterious images" in the totemics of Greek masters blossom in the IV century BC, for example in the famous panther from Kul-Oba.

This shows the presence of syncretism in the culture of the Ancient Bosphorus from the very beginning, which manifests itself in the mountain funeral rite.

Western and Thracian traditions have also affected here. But the formation of many cultural elements of the ancient Thracian animal style was also influenced by eastern penetrations.

10 HANDMADE VERSUS WHEEL-MADE POTTERY

Author(s): Tsetskhladze, Gocha (Linacre College, Oxford)

Presentation Format: Oral

Finds made of handmade pottery during the excavation of Greek colonies, especially those around the Black Sea, have always caused problems of interpretation. The vast majority of academics consider such discoveries as an indication of the existence of a local population within a Greek colony or, if the proportion of this kind of pottery is high, that the Greeks were living within a local settlement. The question is whether handmade or wheel-made pottery can be considered an ethnic and/or cultural marker in the Black Sea or the Mediterranean. Once again, we are back to the cliché that pots equal people. What is the solution to the conundrum? The context in which the pottery is found matters. Of late, the opinion that the Greeks who settled around the Black Sea from the late 7th century BC until the early Classical period lived in subterranean and semi-subterranean dwellings has received broader acceptance. Some of these so-called pithouses have yielded not only Greek but also handmade pottery. But what kind of pottery is it? Wheel-made pottery is tableware; handmade is cooking vessels. Handmade pottery is sometimes as much as 30-35% of pottery, but the vast majority of pottery found is tableware. It is very reasonable to suggest that the Greeks did not bring with them or import cooking pots, rather that they got them from the surrounding local population or, most probably, produced them themselves.

11 MIGRATION AND DIETARY TRADITIONS IN THE PHOENICIAN AND PUNIC WEST MEDITERRANEAN: CASE STUDIES FROM IBIZA AND SARDINIA

Author(s): Van Dommelen, Peter (Brown University)

Presentation Format: Oral

Beyond the Greek colonial worlds of South Italy and Sicily, Phoenician and later Punic settlers established themselves across much of the West Mediterranean, and as in the Greek world, interacted with the indigenous inhabitants they encountered. The island of Ibiza stands out in the colonial histories of the ancient Mediterranean, because it was uninhabited when Phoenicians first established the site of Sa Caleta around the mid 7th c. BCE, and all its inhabitants therefore arrived from overseas. This is worth noting, because the one initial site was replaced with a substantial town (modern Eivissa) and, from the 5th and 4th centuries BCE onwards, numerous smaller rural sites and cemeteries. Because of these particular circumstances, the island and its Phoenician and Punic settlements and burial sites offer a unique opportunity for a comparative approach to study migration and colonial interactions, especially as bioarchaeological studies are beginning to add new evidence to these studies - so far mostly through isotope analysis.

In this paper, I will compare the Phoenician and Punic evidence from Ibiza with that for central west Sardinia, where the area around the Gulf of Oristano has been intensively investigated, focusing in particular on new evidence for dietary traditions and the implications it may have for our understanding of migration and colonial interaction. I will conclude by offering some insights from these cases for comparison to the Greek colonial world.

400 THE FUTURE OF ROCK ART - DOCUMENTATION, RESEARCH, AND OUTREACH

Theme: Archaeology and the European Year of Cultural Heritage

Organisers: Horn, Christian (Gothenburg University) - Díaz-Guardamino, Marta (Cardiff University) - Koch, John T. (University of Wales) - Bertilsson, Ulf (Gothenburg University; Swedish Rock Art Research Archive) - Ling, Johan (Gothenburg University; Swedish Rock Art Research Archive)

Format: Regular session

Rock art documentation, research, and public outreach are tightly interlinked. New methods of documentation spark new research questions and new research ideas drive methodological developments. The introduction and wider use of image-based and range-based 3D modeling techniques in the UNESCO world heritage areas of Valcamonica, Italy, and Tanum, Sweden, as well as in Iberia, and elsewhere in Europe have opened new venues for research and outreach to the public. This work refreshes theoretical perspectives, for example, the biographical approach.

Technological advances permit the comparison and display of rock art at resolutions beyond the capabilities of human eyes alone challenging, for example, established chronologies through the study of superimpositions. Image recognition algorithms not only provide a way to process more data, but enable new collaborations between archaeology, digital humanities, data sciences, and philosophy of science. Equally important, replicas generated from 3D documentation can promote public engagement by enhancing visual-tactile understanding. High-quality comparanda from all rock art regions in Europe allow us to approach later prehistoric rock art as a trans-European phenomenon.

This session aims to provide a forum for all rock art researchers to discuss the new technologies, the opportunities they provide, and the challenges that may arise, for example, the integration of new data, older documentations, research, and public presentation. The lead questions are: how do we shape the future of rock art studies? How do we interlink methodological, theoretical, and practical advancements in the preservation, protection, and study of the crucial cultural heritage rock art?

ABSTRACTS

01 ROCK ART BIOGRAPHIES: THE CONTRIBUTION OF DIGITAL IMAGING TECHNOLOGIES

Author(s): Díaz-Guardamino Uribe, Marta (Cardiff University)

Presentation Format: Oral

Rock art images and panels have been traditionally treated as static symbols and 'closed' compositions, while their materiality, fluidity and changing roles in cultural production through time were overlooked. Rock art is the product of the dynamic interplay between people, tools and the rock surface. The properties of the rock panel have the capacity to shape rock art production as much as the skill and knowledge held by the engraver/painter and the social context in which these engagements take place. Furthermore, rock art panels may accrue complex biographies via multiple engagements.

This paper will present the results of recent research on the 'biographies' of Late Bronze Age 'warrior' stelae in Iberia by means of digital imaging technologies (e.g. RTI, close range photogrammetry). Focus will be placed on the 'chaîne opératoire' involved in their production, as well as on the various natural and anthropogenic post-depositional processes that have contributed to their present state. The results of this research are shedding light on the roles of craftspeople and long distance connections in the making of the 'warrior' stelae tradition in Iberia. Despite iconographic standardization there is variability in the techniques and procedures

deployed. Furthermore, stelae can be reworked at later stages and reused in a variety of ways, opening up a debate about the temporality of rock art traditions.

02 THE FUTURE OF ROCK ART — INTERSECTIONS WITH HISTORICAL LINGUISTICS

Author(s): Koch, John (University of Wales)

Presentation Format: Oral

The paper will consider ways in which new approaches to rock art and stelae — especially in the Iberian Peninsula and Scandinavia — will have potential impact on the study of language, with reference to the following areas:

- 1) how advances in the comparison and analysis of widespread motifs carved on stone can be augmented by 'linguistic palaeontology' (i.e. the study of shared inherited Indo-European vocabulary that refers to the same artefacts, social roles, and mythological themes as depicted in rock art);
- 2) how advanced technology could be used to improve our understanding of the relationship between the Bronze Age stelae of the south-western Iberian Peninsula and the stelae with writing of the Early Iron Age;
- 3) how advances in technology might now be used to test the hypothesis that particular motifs and particular types of stelae handled in particular ways are inherently Indo-European and can be used to track the expansion of Indo-European-speaking groups;
- 4) the challenge and necessity of integrating language and literature into the study of later prehistoric rock art for public engagement and outreach.

The paper will consider these subjects as they affect specialist researchers in archaeology, historical linguistics, and archaeogenetics, as well as implications for secondary education, museums and other areas of public engagement.

03 MODELS, REASONING AND ENGAGEMENT - ON THE MEDIATION BETWEEN THEORY AND PRACTICE IN IBERIAN ROCK ART STUDIES

Author(s): Alves, Lara (CEAACP - University of Coimbra)

Presentation Format: Oral

Areas of contact between different rock art traditions become ideal thought provoking research fields for the specific questioning they are able to raise. Hence, the north-west of Iberia is a particularly interesting region for the study of European rock art for it is known that two major traditions come together here: Atlantic Art, which is typically carved on open air outcrops and expands across Atlantic Europe and Schematic Art paintings, mainly found on rock shelters and shallow caves across the western Mediterranean. Also, both traditions seem to influence the character of the designs found in dolmens and passage graves at a particular stage of their long-term sequence.

In recent years, advanced techniques of 3D documentation have largely been regarded as mere recording methods and their use as an end in itself. However, they may be enable us to tackle old research questions that could not be addressed by traditional recording techniques but they are also rigorous means of illustrating innovative theoretical proposals.

This paper addresses the role of recent digital imaging technologies in the epistemological development of rock art studies, bringing case studies from northern Portugal including Côa Valley Schematic Art sites, the assemblage of Atlantic Art carvings of Monte Faro and the Megalithic Art from the Viseu region.

04 PETROGLYPHS OF KARELIA AS A PART OF THE WORLD CULTURAL HERITAGE: PROBLEMS OF STUDY, PRESERVATION AND PRESENTATION

Author(s): Lobanova, Nadezhda (Karelian Research Centre Russian Academy of Sciences)

Presentation Format: Oral

The purpose of the paper is to summarize various aspects of the problems of study, preserving and management of Karelian petroglyphs, which have acquired special interest and relevance in recent times. Karelia enjoys a remarkable example of original rock art of the Neolithic Age including over 4,5 thousand images and representing the material and spiritual culture of the people living on the eastern coast of Lake Onega and in the lower reaches of Vyg River. These carvings are a single example of Northern European rock art represented in its pure form with no early or late massiveness. Nowadays petroglyph of Karelia are one of the most famous brands in science, education and tourism, placing demands on sustainable management and on dissemination of proper knowledge pertaining to it. They are characterized by a relatively high degree of preservation and minor impact of natural and anthropogenic factors on them. At the same time, there are some problems related to the preservation and use of the monuments.

Rock Art sites are caused by slow natural processes including rock weathering, rock smoothing by ice and water, rocks splitting off from the massive beds, encrustation with various lichen types. A negative anthropogenic factor came through modern inscriptions and drawings.

Since 1977 and up to now, multi-disciplinary monitoring has been carried out on the entire petroglyph territories. Some negative factors affecting them have been identified and fixed, problem petroglyph groups have been identified, recommendations on petroglyph preservation and presentation have been developed and they are using in a real-case scenario. An important task is creation an open-air rock art museum, ensuring the stable preservation of rock carvings groups and the surrounding natural landscape.

Currently, work is underway to prepare an application for the inclusion of Karelian petroglyphs in the World Heritage Sites List.

05 TO THE ISSUE OF DOCUMENTING THE WALL PAINTINGS IN KAPOVA CAVE (A STUDY OF THE CHAMBER OF SIGNS)

Author(s): Anisovets, Julia - Zhitenev, Vladislav (Lomonosov Moscow State University)

Presentation Format: Oral

Kapova cave is situated in the Southern Urals (Russia). The Upper Paleolithic wall paintings were discovered in 1959. The further archaeological research was conducted by O. Bader (1960-1978) and V. Shchelinsky (1982-1991). The Southern Urals archaeological expedition of the Lomonosov Moscow State University started to work at Kapova cave in 2008.

Since the discovery of the paintings in Kapova cave there have been made several attempts to document them provided by archaeologists (O. Bader, V. Shchelinsky), and by specialists in natural sciences (A. Ryumin, Y. Lyakhnitsky, A. Solodeinikov). But there is still no complete catalogue with all the necessary materials. One of the main problems encountered by the Southern Urals archaeological expedition of MSU during the cataloguing of the wall paintings were the problems in identifying images of poor preservation, determining boundaries for measurements, co-relationship of separated stains. The Chamber of Signs contains about 60 images, including zoomorphic figures, geometric signs and amorphous objects. Many of them are hidden under the calcite crust, which complicates their identification.

Thus, working with the wall paintings of Kapova Cave requires great attention to the details: relief, color, location of the stains, geomorphology.

The importance of this problem is determined by the need for clear measurement criteria for monitoring of wall images. The authors offer a new approach to documenting the wall paintings of Kapova cave, based on the latest results of work in the Chamber of Signs.

06 AN ATTACHMENT HOW TO THE SAFE FUTURE OF ROCK ART

Author(s): Dusko, Aleksovski (World Academy of Rock Art)

Presentation Format: Oral

We know very well that rock art is the basis of the world's cultural, historical, prehistoric, ethnological, written, and philosophical religious heritage. For these reasons, we all need to take full care of rock art in any corner of the world. We also have to provide a good future for painted and engraved rock art. We are aware of the fact that there are parts of the world where the institutions of the state system do not allow exploring rock art. It's tragic. This my essay should help, how to approach the rock art of man in all countries in the world. The Balkans: Montenegro, Serbia, Bosnia, Croatia, Bulgaria is rich in engraved rock art. But archaeologists in these countries think that the engraved rock art that people accidentally reveal has no historical value. They openly say that those drawings are made by shepherds when they have nothing to do!!!

This my essay should give a kind of contribution, how, rock art to be explored in all parts of the world where rock art exists.

07 DEEP LEARNING AND ROCK ART

Author(s): Ling, Johan (SHFA)

Presentation Format: Oral

Scandinavian Bronze Age rock art is world famous and has stimulated research for almost 200 years. Over the years, scholars have tried to identify different carving events, however, the results of such attempts have remained inconclusive due to limitations of existing documentation techniques. This situation has changed with the introduction of new ground-breaking 3D techniques. It is now possible to trace different carving events in detail and thereby track the different chronological sequences of individual carvings. This scientific breakthrough needs to be framed by new research questions and an updated theoretical framework. To investigate this data and explore the transformation of rock art the Swedish Rock Art Research Archive's (SHFA) has developed an interdisciplinary platform for data-driven analysis. The platform will use methods from the fields of Computer Vision and Machine Learning for image recognition, object detection, and segmentation. Ultimately, the algorithm will be able to recognize images such as boats from different periods. By applying deep learning algorithms, it is possible to acquire information about: (i) chronology and biography of the panels (ii) different cuttings techniques and perhaps also identification of individual artists (iii) separation of cuttings from different periods in rock art sceneries with many individual items. Moreover, this project will record, analyse and interpret the temporality of social action on the rocks framed by an updated theoretical approach integrated into the 3D imaging: (i) 3D visualization and its significance for micro-chronologies, craftsmanship and the interpretation of images. (ii) 3D visualization and its significance for panel biographies, memory and changes in the landscape and society. The results will be published in a monograph entitled "Rock art Biographies".

08 BEYOND THE 3D MODEL. TECHNICAL IMPROVEMENTS ON THE APPLICATION OF VISUALISATION ANALYSES FOR ROCK ART RESEARCH

Author(s): Vázquez-Martínez, Alia - Carrero-Pazos, Miguel (GEPN-AAT. University of Santiago de Compostela) - Vilas-Estévez, Benito (University of Vigo)

Presentation Format: Oral

The way of documenting open air rock art panels in Galicia (Northwest of Spain) has been gradually changing in recent years thanks to the introduction of 3D modelling techniques in rock art research. Unlike traditional recording methods, such as rubbings by frottage, raking light or plastic tracings, 3D techniques reduce the contact with the recorded surface and allow researchers to get more reliable and accurate metric information from the rock art panels.

Thus, and due to the use of digital imaging techniques, 3D models can be examined in depth to study the multiple grooves that make up the different motifs, and therefore calibrate and contrast previous tracings to propose new rock art readings, an important advance in those cases that are found in a bad state of preservation. However, these methods are not trouble-free, and should be used in a critical way always linked to fieldwork.

The purpose of this communication is to show how the application of several post-processing methods over a 3D model from a specific petroglyph, Chan da Isca I-II, located at the Archaeological Rock Art Park of Campo Lameiro (Pontevedra) have allowed us to highlight deteriorated motifs, sometimes imperceptibles to traditional techniques or human eye at site, and resolve overlapping issues which helped to differentiate independent motifs.

09 DIGITIZATION, PUBLICATION AND COMPUTATIONAL DATA ANALYSIS WITH INDONESIAN ROCK PAINTINGS

Author(s): Grasshoff, Gerd (Humboldt-Universität zu Berlin)

Presentation Format: Oral

Rock paintings in Indonesia were recorded during three short excursions by Markus Wäfler and Wolfgang Marschall. Threatened by environmental changes and human interventions and activities, these rock paintings represent the latest specimen of early drawings in that region. Their age determination has not yet been completed, but Australian researchers consider some of them to be the eldest testimonies of figurative drawings of early mankind. All rock paintings have been digitized and integrated into a digital collection according to current standards. They adhere to the FAIR principles of scholar digital data. The data are based on the drawings from the first three volumes published by Wäfler and Marschall. The rock paintings were re-drawn by Markus Wäfler, and have, after their digitization by Thomas Hofmeier, been processed by Gerd Grasshoff and Gordon Fischer so that they could be uploaded into the database. A fourth volume with individual figures in systematic categorization will be published by Markus Wäfler. The authors Markus Wäfler and Wolfgang Marschall have opted for an open-access publication to make the data widely available to researchers and the interested public. Markus Wäfler copied the entire scope of individual figures and will present a detailed classification of the illustrated objects. The data interface allows modern, computeraided methods for analyzing the rock paintings. The huge advantage of modern tools of data analytics will be shown with digital Notebooks on Jupyter basis. Deep learning techniques open new avenues of interpretation.

Project access DOI: 10.17171/1-7.

10 DIGITAL FROTTAGE - CREATING GRAPHIC REPRESENTATION FROM PHOTOGRAMMETRY

Author(s): Horn, Christian - Potter, Rich (Gothenburg University) - Pitman, Derek (Bournemouth University)

Presentation Format: Oral

This paper presents a novel technique for visualising three-dimensional, digital records of rock art using raster-based processing within geographic information systems. Techniques for 3D documentation of petroglyphs are increasingly commonplace in rock art study yet present problems with accessible visualization and dissemination. Viewing and interpreting visual records typically requires processor-heavy software suites that enable lighting and viewing angle adjustments. Consequentially, images recorded using analogue documentation processes are often considerably clearer in static form.

This study exploits approaches more readily associated with landscape study, namely topographic approaches to 3D digital elevation models. The suite of techniques available allows clear visualisation of micro-topographical detail and results in a visually clear image that maintains the authenticity of the record. This approach allows complex three-dimensional files to be reduced to clear two-dimensional images that are both quick to produce and accessible. The images are produced from high-resolution photographs and can be used to get a general overview, while also allowing the viewer to focus on smaller details such as intersecting engraved lines. The small file size and clarity of the resultant images can be distributed easily on both fixed and mobile platforms. This format allows furthermore both experts and non-experts to engage with engraved rock art.

11 THE ROCK ART RESEARCHER: AN ENDANGERED SPECIES?

Author(s): Dodd, James (Aarhus University)

Presentation Format: Oral

In this paper, the future role of the rock art researcher in the context of rock art documentation and research will be discussed with reference to wider debates concerning the increasing influence of technology, big data and automation. After having examined selected developments that give enhanced and / or fresh possibilities to document, present and analyse rock art, a critical evaluation of the of past, present and future direction of rock art documentation will be offered.

Previous, well-executed surface based documentations using more objective methods (frottage and photography) are a rich and valuable resource, that should neither be ignored or devalued. The records, past and present, contain more information that we have not yet recognized. New technologies are, in a number of cases, very user friendly. However, the skill of the workers still impacts on the quality of the result. The new technologies integrate and contain new types of information, but they can nonetheless be manipulated. The results are not an exact copy of the surface. What is seen on the screen is a representation of reality, not reality itself. We should be mindful of the view of some scholars, who advocate the preservation of the dialogue with the surface. The utopian elixir of a completely objective, accurate, documentation does not exist. Some claim that they can see details on their screens that they cannot see with the naked eye. How this is articulated needs to be critically assessed, case by case, on its own merits, with reference to evidence from the original source, not just the model.

It is hoped this contribution in a formal setting will encourage more widespread critical awareness of these matters and convey that there remains a need for specialists in rock art documentation.

407 ARCHAEOLOGICAL BIOMOLECULES FROM MUSEUM SPECIMENS: STRIKING A BALANCE BETWEEN CURATION AND DESTRUCTIVE SAMPLING

Theme: Museums and the challenges of archaeological outreach in the 21st century

Organisers: Wales, Nathan (University of California, Berkeley) - Smith, Oliver (University of Copenhagen)

Format: Regular session

Archaeological specimens curated by museums have the potential to answer longstanding questions on human demography, paleoenvironments, and plant and animal domestication through analyses of ancient DNA, proteins, and other biomolecules. For example, ancient DNA recovered from the Neanderthal type specimen helped refine our understanding of hominin evolutionary relationships. Importantly, this study was only possible because excavated skeletal remains were protected in a museum for over a century. While such projects highlight the role museums play in archaeological research, these cutting-edge biomolecular investigations may lead to damage to irreplaceable ancient and historic specimens. In order to generate new dialogue between museum curators, archaeologists, and other researchers, this session will provide a venue to discuss how museum collections can contribute to pioneering examinations of ancient biomolecules. Speakers will explore the theme from several angles, including 1) case studies of DNA, RNA, protein, and lipid analyses of museum specimens, 2) examination of curatorial practices that can enhance or diminish long-term survival of biomolecules, 3) discussion of differential preservation due to tissue type, such as particular skeletal elements, and 4) strategizing how to mitigate the impact of destructive sampling, such as with 3D digitization. By weighing the tradeoffs of destructive sampling, researchers and museum curators can maximize the scientific potential of specimens and minimize the chance that precious specimens are destroyed for little gain. In these ways, this session aims to publicize museums' active role in archaeological research and further missions of stewardship and public outreach.

ABSTRACTS

01 ANCIENT DNA, RNA, AND PROTEINS... OH MY! AN OVERVIEW OF STATE-OF-THE-ART ANALYSES OF ARCHAEOLOGICAL BIOMOLECULES

Author(s): Wales, Nathan (AMIS Laboratory, Paul Sabatier University, Toulouse; Dept. of Plant & Microbial Biology, University of California, Berkeley)

Presentation Format: Oral

Cutting-edge studies of ancient biomolecules have provided powerful new ways to investigate archaeological questions, leading to significant findings that have drawn major interest from the media and the general public alike. For example, DNA recovered from skeletal remains of modern humans and other hominins have provided new insights into human migration and evolution. In the same manner, biomolecules recovered from archaeological plant and animal remains have been studied to characterize the sequence of events during domestication and crop improvement. Unfortunately, some of these high profile projects have been undertaken with limited communication or mutual understanding between archaeologists, specimen curators, and ancient biomolecule researchers. In order to foster an improved dialogue between these groups, in this presentation I will discuss the main approaches used to study ancient DNA, RNA, and proteins. Using non-technical terminology and concrete examples, including my own research on the domes-

tication of the common sunflower, I aim to provide a general picture of what is now feasible, how these techniques work, and how archaeological specimens are impacted in the process. With this knowledge in hand, attendees will be better equipped to evaluate case studies presented in this session, and just as importantly, identify which tools could be used to address their own research questions.

02 BONE RUSHES: A VIEW FROM MULTIPLE PERSPECTIVES

Author(s): Peyroteo Stjerna, Rita (Dep Organismal Biology, Human Evolution, Uppsala University; UNIQ, Centro de Arqueologia da Universidade de Lisboa)

Presentation Format: Oral

Archaeological museum collections are mixed repositories of artefacts, remains of past human activities, and documentation. Frequently, these collections are records of pioneer archaeological research with an intrinsic historic value for the history of science in general and archaeology in particular. The historic value of the collections adds yet another layer to the complex web of intricacies when negotiating the relevance and impact of research versus its outcome.

Currently, archaeological human bones are particularly disputed remains in a much larger multitude of materials that constitute a typical archaeological assemblage. This pursuit of human bone is a 21st century phenomena which is changing the archaeological research paradigm and has taken museum curators (and archaeologists) by storm. Recent techno-methodological advances have improved our ability to investigate human histories through biomolecular analyses of human bone. While this revolution has opened the field to researchers from outside the discipline of archaeology offering exciting new opportunities, it has arguably exposed rare archaeological materials to non-specialists, increasing the strain on museum curators.

In this paper I will present considerations drawn from my own experience as a doctoral and postdoctoral researcher working with thousand years old human remains from historic museum collections. I will discuss the scientific value of archaeological museum collections, their potential and limitations, as well as current best practices regarding destructive sampling approaches, such as DNA or Radiocarbon analyses of human bone. I wish to present a view from multiple perspectives aiming at building bridges between the different disciplines converging to the study of museum collections, as well as highlight the importance of interdisciplinary research when dealing with valuable heritage material such as the human bones of past populations.

03 ANCIENT DNA FROM MUSEUM ARCHAEOBOTANICALS: PERSPECTIVES ON UTILITY, AVAILABILITY, AND THE WORTHINESS OF DESTRUCTIVE SAMPLING

Author(s): Smith, Oliver (University of Copenhagen)

Presentation Format: Oral

The route from archaeological site to ancient DNA laboratory is rarely straightforward. Samples often pass through many hands before their inevitable destruction, and as such, multiple parties are often involved in decision making. To compound this process, the likelihood of success is equally a concern of excavator, curator and scientist alike, especially where samples are rare enough to be considered of special interest. Occasionally, a site might yield consistently well-preserved and plentiful archaeobotanical remains, although this is by no means usual. More likely is that a single plant sample, or derivative such as cloth, might be sampled very partially to minimise the potential losses, but in doing so increases the chances of analytical failure. Where should these lines be drawn? How far should curators and scientists go to achieve the scientific aims? What is the true likelihood of successful aDNA analysis, given the lack of published negative results?

In this presentation, we will summarise the successes and pitfalls of archaeobotanical DNA sampling, drawing on positive results, all-too-often unpublished negatives, and their occasional publication. Although a consensus or framework between the various parties involved, standardised or otherwise, is a long way off at this point, we hope to highlight the importance of scientists and curators engaging in dialogue with concerns to the likelihood of success, and not being blindsided by a biased record of largely positive published results.

04 DNA FROM THE WINE DARK SEA: SEARCHING FOR ANCIENT DNA ON MEDITERRANEAN SHIPWRECKS

Author(s): Briggs, Elizabeth (University of Oxford)

Presentation Format: Oral

Finding a way to accurately characterise the contents of amphorae recovered from Mediterranean shipwrecks would provide invaluable insight into cargo compositions and trade dynamics. Is DNA the answer? There is tremendous potential for DNA studies to resolve long-standing questions in both terrestrial and underwater archaeology. Great optimism for the recovery of ancient DNA (aDNA) from maritime sites has spurred a series of studies claiming to have successfully extracted aDNA from a variety of artefacts recovered from underwater sites including plant remains (Elbaum et al 2005; Manen 2003), human skeletons (Hershkovitz 2008) and shipwreck amphorae (Hansson and Foley 2008, Foley et al. 2012). In the latter study, the authors claim to have used non-destructive methods obtain ancient DNA from amphorae in museum collections. However, these studies have not adequately addressed the source of the DNA recovered: does it derive from taxa present in the underwater deposition environment or the artefact itself? Is it, indeed, possible to obtain ancient DNA from archaeological ceramics through non-destructive methods? My research eliminates this ambiguity by examining the efficacy of extracting aDNA from the ceramic matrix of vessels recovered from five ancient Mediter-

anean shipwrecks and establishing what DNA is present in the water column and seafloor sediments that surround these sites. The methods used in this research promise to set a new standard for the recovery of ancient DNA from underwater archaeological sites.

05 CAN GENETIC ANALYSIS OF MUSEUM SPECIMENS BE USED FOR PALAEOPARASITOLOGY?

Author(s): Ryan, Hannah - Dimopoulos, Evangelos-Antonios (University of Oxford)

Presentation Format: Oral

Phylogeographic analysis of parasites is a relatively recent field of research, which has the potential to be utilised to also infer the phylogeography of the parasite's hosts. Most studies in this area focus on viral or bacterial organisms, however, few studies have assessed regional genetic variation of helminths. These species are an attractive alternative study system in archaeology due to their resistance to diagenesis, the specificity of their life cycles, the low mortality levels associated with infection and their ubiquitous nature. For an accurate interpretation of migration, there needs to be a thorough understanding of how the genetic variation differs between geographic regions. This is usually achieved by combining both modern and ancient DNA. Gaining such an understanding is somewhat problematic in the case of helminths, as they are no longer endemic globally. One way in which this gap in data could be filled is with museum samples. Seven samples from Oxford's Natural History Museum were selected to test the feasibility of extracting DNA. Analysis suggests that endogenous DNA is present in at least one of the samples but, the quality and quantity retrieved is not sufficient for addressing phylogeographic research questions. There is the potential that taking larger sample sizes may improve our results but whether this is worth the destruction of museum collections is up for debate.

06 WHICH IS THE SPECIES? PALEOPROTEOMICS APPLIED TO PAINTED ARTIFACTS FROM ANCIENT EGYPT

Author(s): Granzotto, Clara - Cappellini, Enrico (Natural History Museum of Denmark; University of Copenhagen)

Presentation Format: Oral

A number of natural products found in the ancient world have adhesive properties and could have been used as binding media by the ancient Egyptians. Among these materials, proteins from hide and bones, egg and milk have been mentioned to be used as binders in painted artworks since, once exposed to dehydration, they aggregate into complex supramolecular structures and bind inorganic pigment particles. The correct identification of the proteinaceous paint binder, as well as the characterization of its molecular damage, can provide important information on the artist's technique and artifacts' manufacture, can help to answer questions of trade and provenance, and to develop proper conservation treatment strategies compatible with the original materials.

A significant part of the vast artistic production of ancient Egypt is still available to us, carefully preserved in archaeological collections worldwide. However, ancient sources provide limited information about the use of proteinaceous materials as paint binders in ancient Egypt, leaving several questions open such as: were different proteins preferred for different applications? Did they differ according to period and geographical area? How did proteins in paint formulations modify over millennia? Very recently, the introduction of revolutionary analytical approaches, most notably high-throughput mass spectrometry (MS)-based protein sequencing, allowed confident sequencing of ancient proteins. This new, robust and reliable approach, called paleoproteomics, can provide very innovative results in the study and protection of cultural heritage collections. In this study micro-samples from different artifacts, such as painted coffins and cartonnage, dating 3000 BC – 600 AD, have been investigated by state-of-the-art high resolution MS-based proteomic strategies. Challenges due to the complexity of art samples, together with the incredible potentiality of paleoproteomics applied to art materials, are discussed.

409 HOW TO BEAT THE BARBARIANS? ROMAN PRACTICE TO ENCOUNTER NEW THREATS (1ST-5TH CENTURY AD)

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Rubel, Alexander (Institute of Archaeology Iasi, Romanian Academy) - Voß, Hans-Ulrich (Römisch-Germanische Kommission des Deutschen Archäologischen Instituts)

Format: Regular session

During its long existence, the Roman Empire was confronted with changing threats. As a response to new geostrategic situation, e.g. during the crisis of the 3rd century AD, induced by the "barbarians" who – often already part of Roman military structures as mercenaries and auxiliaries – became a veritable menace for the Empire, Rome adopted different strategies: they oscillated between inclusion, warfare and different forms of exerting influence. The session tries, therefore, to explore the archaeological evidence for Roman practice and especially the probably very different approaches of power and influence in the central regions on the one hand, and the south-eastern parts of the European "Barbaricum" on the other. "Divide et impera" as practical policy based on alliances, as well as consequent warfare (like the Harzhorn-event indicates) and diplomatic initiatives, which are traceable by prestige-goods and subsidia treasures found in the Barbaricum, had been presumably the issue of the day. Thus written sources (Ammianus on the motives of Valens to integrate the Goths as future soldiers against the Parthians), as well

as the archaeological record can give us hints about the changing strategies of the Empire in Late Antiquity. The comparison of Roman imports in different parts of Iron-Age Europe provided by scholars from all over Europe will help understand better a complex process of shifting power and influence in an emerging new Europe, which transformed the Empire towards medieval "Herrschaft" and social structure.

ABSTRACTS

01 INTRODUCTION: BEYOND THE FRINGES OF EMPIRE: NEW APPROACHES CONCERNING ROMAN INFLUENCE AND POWER IN THE BARBARICUM

Author(s): Rubel, Alexander (Institute of Archaeology, Iasi) - Voß, Hans-Ulrich (Römisch Germanische Kommission des DAI)

Presentation Format: Oral

In the wake of the Marcomannic Wars (166-180) the basic parameters of some 200 years of Roman dominance changed completely. Especially in the remote regions of today Eastern Germany, Poland and Slovakia the balance of power in the networks of Barbarian "kingdoms" was completely screwed up. This led to an urgent need for new strategies in face of new challenges. Already in the so called "crisis" of the 3rd century we can see that Roman diplomacy and new alliances (especially in Thuringia, see e.g. the principal grave at Gommern) was reset and made a campaign in the inner heart of the "Germania" possible, long ignored by historiography (Harzhorn-Event). Besides this we have to deal also with new ways of diplomacy during Late Antiquity (including the interpretation of "imports"), and with massive forms of interference in the affairs of Barbarians, which goes as far as to the introduction of political assassination as a new means of aggressive diplomacy. In the meantime we witness a new defensive strategy at the Danube. "Inner Fortifications" in hinterland of the limes, first attested in Pannonia, lately also in other regions along the Danube (also Scythia Minor), give archaeological hints to an otherwise not attested strategy of defense. In this introductory paper to the session we want to present also the case of the Germanic chief Macrian, which was "object" of several strategies of appeasement by Valentinian I., which can be seen around the year 370 as a kind of showcase of the new ways of Roman Foreign and Security Policy. We also would like to ask if in this context the fall of the Roman Empire should perhaps rather be interpreted as an unpredictable accident, than a foreseeable fate of an Empire in decline.

02 RIVERINE SOCIETIES OF THE EXTREME PART OF THE LOWER DANUBE: BARBARIAN INVASIONS AND ARCHAEOLOGICAL EVIDENCES

Author(s): Alexianu, Marius-Tiberiu (Alexandru Ioan Cuza University of Iasi, Romania)

Presentation Format: Oral

The written sources described the extreme region from the Lower Danube as one constantly affected by barbarian invasions hailing from north of Europe's largest river. As an autoptic and autopathic witness, Ovid observed that the river in its natural state (liquidus) played a defensive role for the Greek communities south of the great waterbody. However, when the Hister became solid (gelidus), this function was annulled, as the ice bridges allowed the crossing of the barbarian invaders. For Ovid, the civilized communities from south of the Danube embody the concepts of hellenismos/romanitas, while those from the north are defined as barbaries/immanitas. This strongly antithetic view is also betrayed by later written sources. Archaeological research has nevertheless highlighted another facet of the issue, which reveals the reductionist and simplified view of the Latin authors. Archaeological research has revealed a very large number of Roman artefacts, from which we only mention hoards of silver objects, coins and ceramics. The latter category is remarkable on account of the quantity of amphorae used for transporting olive oil and wines. The transportation routes of the amphorae had been in use by the Greeks for several centuries before the Roman entrenchment on the Lower Danube. It was again the Greek merchants who used them afterwards, now as a people under the sway of the Empire. Accordingly, these amphorae transported into the Barbaricum represented the Roman civilization. With respect to the intensity of their diffusion into the aforementioned area, it suffices to mention that they are not absent from any of the known Daco-Carpic settlements of the 2nd-3rd centuries. The general picture thus emerging, demonstrate once again that the archaeological key is crucial with respect to the complex historical approach to certain contact areas between the Barbaricum and the Roman provinces.

03 MEDITERRANEANISM BETWEEN COMMERCE, GIFT AND PLUNDER. THE ELITES FROM THE DACIAN POWER CENTRE FROM CRAIVA - PIATRA CRAIVII (TRANSYLVANIA, ROMANIA)

Author(s): Plantos, Cristinel (Arheosib Consulting SRL)

Presentation Format: Oral

In the Transylvanian space, as well as in other neighbouring areas, the beginning of the late phase of the La Tène civilization lead to an increased tribal and extra-tribal economic metabolism, in which having control over commerce and over the means of communication was of crucial importance.

The fortress and the settlement from the late Latène period from "Piatra Craivii" was a power centre of the Dacian world, in which political, military, economic and spiritual affairs were recorded both by ancient scholarly sources, as well as by the results obtained through archaeological research. The presence of items originating from the Hellenistic and Roman worlds proves the extents of the external contacts and of the cosmopolitanism of this settlement. Besides the social and cultural value they held in ancient times,

the items from the Hellenistic and Roman areas from Piatra Craivii are today particularly relevant and they aid in establishing the chronological limits of this site.

An overview on the Mediterranean items present in pre-Roman Dacia shows that most of them are connected to conviviality, funerary, fashion and urban practices, and they may also be of numismatic nature. All of these functions can be found in the case of all items under scrutiny; the presence of these Mediterranean items in this area can have multiple explanations.

04 BARBARIANS OF THE NORTH – MEN OF THE WORLD OR ROME’S HILLBILLY ALLIES?

Author(s): Jensen, Xenia (Moesgaard Museum)

Presentation Format: Oral

Even though southern Scandinavia was never part of the Roman Empire, thousands of Roman produced products like banquet service of glass, copper-alloys and precious metals, jewellery and dress accessories, coins and military equipment alongside the more exotic imports such as statuettes, livestock and spices found its way to the barbaric North. However, the character of the influx of Roman goods into Scandinavia changes over time with mostly unique and rare luxury items in the 1st century to a clear overweight of mass-produced goods from the late 2nd century AD and on.

Equally important is the fact, that precious metals like gold, silver and the components of copper-alloys do not occur naturally in the area, a substantial amount of local metal objects from the period in question are made from melted-down imports. Consequently, the amount of Roman imports identified in southern Scandinavia comprises only a fraction of the original number.

This paper will discuss the Roman touch on Scandinavia from two different angles:

- 1) Seen from a North European perspective: Was it simply a question of supply and demand or does the apparent increase in militarisation of South Scandinavia require a new, spectacular visualisation of diplomatic and military power?
- 2) Seen from a Roman perspective: Did the Romans even care about the North or does the change in influx reflect a change in Roman foreign policy where the tribes of Northern Europe suddenly become significant players?

05 HOW ‘TO BEAT’ THE BARBARIANS WITH BEADS AND COINS?

The case of the Sarmatians living West of Roman Dacia

Author(s): Grumeza, Lavinia (Institute of Archaeology, Iasi)

Presentation Format: Oral

The part of Barbaricum addressed by my paper is a ‘buffer zone’ located between three highly militarized Roman provinces: Pannonia-Moesia-Dacia. In the literary sources, the ‘barbarians’ inhabiting these area are called Dacians (1st c. BC-2nd c. AD) and Sarmatians (1st-5th c. AD). The products of Roman origin entered these region especially during the 2nd c. AD along with miscellaneous groups of peoples taking part in the Marcomannic wars.

The most numerous and diverse category of artefacts discovered in Sarmatian graves is represented by beads (from one grave alone, at Pančevo, 2215 beads have been excavated!). The beads and other Roman ornaments reached the territories occupied by Sarmatians especially through trade, long-distance exchanges, or through itinerant merchants. The vast quantities of denarii dated to the 2nd century could indicate stipendia received by these gentes.

Taking into considerations these last remarks, there are several questions I will try to answer, the following probably being most important: 1) What was the political role of these gentes, considering their location between three provinces? 2) Was there an established Roman control through the spread and use of Roman items (desired and needed)? 3) Is it possible to speak about a ‘New World tactic’? (We know that the Europeans used jewellery with Native Americans to make them friends and gain their favours).

06 THE TOWN OF (L)IBIDA (SCYTHIA MINOR) IN THE CONTEXT OF A NEW DEFENSE STRATEGY OF THE EMPIRE IN LATE ANTIQUITY

Author(s): Rubel, Alexander (Institute of Archaeology, Iasi)

Presentation Format: Oral

Based on recent research, especially in Pannonia (O. Heinrich-Tamáská), the Danube witnessed an eminent change in defense strategy since the time of Diocletianus and Constantinus. The emergence of new forts of small and medium size and the fortification of existing settlements and towns along the Danube is only visible in the archaeological record. The so called “Innenbefestigungen” are visible signs of a new approach by the Empire to take a stand against the Barbarian invasions, beginning in the aftermath of the Marcomannic Wars. This paper tries to align the latest research at the site of Slava Rusa, ancient (L)ibida together with information from the sites Ulmetum and Tropaeum Traiani (all Scythia Minor) in order to establish the conditions of a new defense strategy against Barbarian raids and conquests at the Lower Danube, corresponding to the already well known situation at the Middle Danube. Especially the defensive constructions and their chronology can contribute to an assessment of this settlement in the mentioned context. Thus one of the towers, recently excavated, will be presented as a core element for dating the construction of the massive walls and towers in the first half of the 4th century AD. In an overall assessment the new defense concept in Late Antiquity, together with the new data of the “Harzhorn Event”, can indicate that the Late Empire was not just doomed, but tried with adequate strategies to respond to new challenges.

07 THE LIMES TRADE AND THE ROMAN ARMY

Author(s): Suharoschi, Dan-Alexandru - Dumitrache, Iulia - Curoă, Roxana-Gabriela (Institute of Archaeology Iasi, Romanian Academy)

Presentation Format: Oral

The authors present the results of a prosopographical study concerning the businessmen connected to the military camps and civil settlements from east of the Rhine and north of the Danube. The ethnical structure of the settlements where military units were located is diverse, considering that both natives and Romans lived there, including some veterans who never returned to their places of origin. The study scrutinizes literary and epigraphical documents that refer to former army soldiers and officers that became involved in trade collegia. Some kept in touch with their former army comrades. The inscriptions and the literary sources bring testimony that these erstwhile soldiers used their influence and relations to bring profit and welfare to merchants and their corporations and continued to do so after their retirement, as members in these associations. Their social and economic involvement within the local communities, through membership or patronage of professional or religious collegia, helped them find costumers for their merchandise. They earned respect and financial power, becoming influent members of the local elite. The trade network covers large areas along the Rhenan and Danubian limes and it often encompasses the hometowns and last camp settlements of the veterans. The multiplicity of the implications touches social status, community relations, and family ties.

08 ROMAN SILVER BEYOND THE LIMES. ON THE CHRONOLOGY OF ROMAN IMPERIAL COIN HOARDS DISCOVERED IN THE EASTERN CARPATHIAN BARBARICUM

Author(s): Munteanu, Lucian - Honcu, Ștefan (Romanian Academy Iasi branch, Institute of Archaeology)

Presentation Format: Oral

Over 100 Roman imperial coin hoards dated in the 2nd and 3rd centuries A.D. were discovered in the Eastern Carpathian Barbaricum. Our paper aims to pinpoint some aspects related to the chronology of these hoards, such as the estimation of the moment when they reached the "barbarian" territories and the approximate period of time when they were buried. In our research we analyze the available numismatic, archaeological and historical information. Thus, the composition and chronological structure of the coin hoards, the dating of their most recent monetary issues, and the presence of "barbarous" imitations are taken into account. In some cases, coins are associated in hoards with other categories of archaeological artifacts having their own dating, such as brooches, bracelets, silver and bronze vessels. Particularly important for establishing the chronology of the coin hoards could be the ceramic pots and mugs in which they were housed and buried. Unfortunately, we have few information about the archaeological context of the hoards. Only in few cases they were found within the local settlements, or in their vicinity. Our attempt to date these hoards must also take into account the specific evolution of the relations between Empire and "barbarian" populations located East of the Carpathians, as well as the political transformations that took place within this part of Barbaricum during the 2nd-3rd centuries A.D.

09 MARS AT THE RIVER UECKER IN WESTERN POMERANIA - A FURTHER INDICATION TO ROMAN "DIVIDE ET IMPERA"-POLICY IN GERMANIA?

Author(s): Voss, Hans-Ulrich (RGK - Romano-Germanic Commission DAI) - Schmidt, Jens-Peter (Landesamt für Kultur und Denkmalpflege Mecklenburg-Vorpommern, Schwerin)

Presentation Format: Oral

The Marcomannic Wars of AD 166/168 - 180 mark a turning point in relations between the Roman Empire and its neighbors in Central Europe and Scandinavia. At the end of the 2nd and during the 3rd century AD, the southern Scandinavian war booty offerings throw light on warlike inner-Germanic conflicts, which were also fought with Roman weapons. As the sacrificed armament and equipment shows, the warriors involved also include groups from the northern Elbe area and the Oder-Warthe area which belonged to the Przeworsk culture. Three Roman swords, together with other weapons, military equipment and skeletal remains with traces of violence from the River Uecker directly south of the city of Pasewalk in northeast Germany are dated to the second half of the 2nd and the beginning of the 3rd century AD. The range of finds testifies to an armed conflict during or shortly after the end of the Marcomannic Wars in a region that must have belonged to the deployment or transit area of warriors, whose weapons and equipment were later sacrificed in Scandinavia. Contemporary weapon graves in the vicinity underline that we can see here a "conflict landscape". In view of the reorientation of the network of Germanic elites as a consequence of the Marcomannic Wars, the controversial discussion about Roman influence on internal Germanic affairs also becomes a focus of interest - keywords here are "divide et impera"; "discordia hostium". With the finds from the Uecker-Randow area, the question again arises as to whether the experiences and insights gained by the Roman military leadership during the Marcomannic Wars on the origin of the Germanic tribes that fought both as opponents and allies led to the conclusion that it was possible to remove internal German conflicts to far away from the imperial borders, or even initiate them there.

10 DEFEATING THE DACIANS IN THEIR OWN MOUNTAINS. CONSIDERATIONS REGARDING THE ROMAN TEMPORARY CASTRA FROM THE SOUTHERN CARPATHIANS

Author(s): Berzovan, Alexandru (Romanian Academy, Iasi Institute of Archaeology)

Presentation Format: Oral

During the Dacian Wars of Emperor Trajan (101-102 AD and 105-106 AD respectively), the Roman Army encountered numerous

logistical challenges, due to the difficult terrain and the fierce resistance of the local warriors. These facts are attested by the few existing historical sources, as well as by the famous Column. Of special interest are the military operations conducted by the Romans in order to subdue the Dacian center of power from the Șureanu Mountains, where the capital of Sarmizegetusa was located. This area was defended by a large number of forts located on mountain tops as well as a few linear defensive systems. In order to neutralize these defenses, units of the Roman Army also attacked from the rear, using a number of mountain trail roads crossing the Southern Carpathians. A number of temporary castra remains are still visible today, some of them located at heights of over 2000 meters. While most of them present the classical rectangular look, some of them have slightly atypical shapes, due to the difficult terrain, which forced the Roman military engineers to adapt their designs. In our paper we propose a discussion on these mountain castra, pinpointing the possible strategies used by the Romans that ultimately managed to bring them victory over the Dacians in their own mountains.

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RE-THINKING MEDIEVAL AND EARLY MODERN PESTILENCES FROM A BIOSOCIAL PERSPECTIVE: ADVANCED METHODS AND RENEWED CONCEPTS IN ARCHAEOLOGICAL SCIENCES

Theme: Theories and methods in archaeological sciences

Organisers: Castex, Dominique (CNRS) - Guillon, Mark (INRAP) - Keller, Marcel (Max Planck Institute Jena) - Kacki, Sacha (University of Durham)

Format: Regular session

While contagious diseases have affected the human species since its origins, great medieval epidemics (e.g. plague, leprosy, tuberculosis) have sparked particular interest for decades. In recent years, archaeology has played an increasing role in the scientific study of medieval pestilences, notably by providing reliable data on both the paleobiology of epidemic victims and their burial treatment. Despite the various breakthroughs reached by interdisciplinary research, the study of past epidemics still needs to get improved, particularly through an integrated analysis of biological and social dimensions of these diseases, which are closely interrelated.

We invite contributions regarding both recent methodological advances in the retrospective diagnosis of infectious diseases and the output of archaeological sciences on social and cultural factors acting in human populations' adaptability to these diseases. The session shall address various questions, among which:

- What are the new lines of research and future perspectives in paleopathological and palaeomicrobiological study of these diseases?
- What information paleobiological data derived from skeletal assemblages can provide on the epidemiological characteristics of the diseases?
- What was the endemicity of diseases in various places, how did they evolve over time, and how did various diseases competed each other?
- How funerary archaeology and textual sources contributes to reappraise the history of these diseases (e.g. attitudes towards the victims in terms of their integration and/or exclusion, depending on the time period and cultural framework)?
- Which methodological implementation would be desirable in the future to allow retrospective diagnosis of still poorly-known diseases (e.g. ergotism)?

ABSTRACTS

01 ARCHAEOLOGICAL EVIDENCE OF MEDIEVAL AND EARLY MODERN PESTILENCES: WHERE ARE WE NOW?

Author(s): Castex, Dominique (CNRS PACEA, Université de Bordeaux) - Guillon, Mark (CNRS PACEA, Université de Bordeaux; Institut national de recherches archéologiques préventives) - Kacki, Sacha (CNRS PACEA, Université de Bordeaux; Department of Archaeology, Durham University)

Presentation Format: Oral

It is now well acknowledged that burials related to epidemics can be detected in the archaeological record. Indeed, the peculiar features of certain funerary sites (e.g. presence of mass graves), as well as their chronological, geographical, and sometimes historical contexts, make it possible to reconstruct a part, albeit still limited, of the infectious outbreaks that affected human populations in the past. In recent years, the archaeological documentation on such funerary sites has significantly increased, which now allows the realization of synthetic studies on coherent groups of sites. Archaeology has produced fundamental knowledge on medieval and modern pestilences, in particular by providing data on the paleobiology of their victims, and on their burial treatment and its evolution over centuries. Obviously, the most important advances concern plague epidemics. Some archaeological investigations have however revealed epidemics related to other diseases, some of which have already been identified (e.g. leprosy, typhus, typhoid fever), whereas others are still being discussed (e.g. smallpox, measles). In this presentation, we propose to present an overview of the archaeological data currently available on medieval and early modern epidemics. This in turn will lead us to highlight the abundance

of available data regarding some diseases, and their surprising absence for other ones, and to propose new lines of research that could be followed in bioarchaeology in the near future.

02 TRACES OF MEDIEVAL EPIDEMICS OF PLAGUE, TUBERCULOSIS AND LEPROSY IN CENTRAL RUSSIA

Author(s): Vasileva, Elena - Tarasova, Anna - Engovatova, Asya (Institute of Archaeology Russian Academy of Sciences) - Matsvay, Alina - Alborova, Irina - Pimkina, Ekaterina - Khafizov, Kamil - Mustafin, Kharis (Historical genetics laboratory of Moscow Institute of Physics and Technology)

Presentation Format: Oral

Written historical sources in the 14th century Russia make frequent mention of the instance of epidemic illness (plague, tuberculosis, and leprosy) in central Russian cities and towns. Some cases report the death of entire city populations – others only partially. Sometimes, there are instances where archaeological evidence for such epidemics is excavated. Examples include Moscow and Veliky Novgorod, where huge burial pits (mass graves) have been found, with white gravel used as fill-in. Yet there are also cases of individual burials where the same white gravel is found as a filler – and such burials are also found in Yaroslavl and Dmitrov. In 2017 an expedition from the Institute of Archaeology of RAS in Yaroslavl excavated several individual graves, which display the symptoms of either tuberculosis or leprosy. Paleo-Anthropological analysis was unable to give a firm diagnosis of whether the cause of death had been tuberculosis or leprosy. The bone remains were sent for DNA analysis for further diagnosis, at the Historical genetics laboratory of the Moscow Institute of Physics and Technology. Conclusions about the cause of the epidemics were reached by three parallel analysis methods, as follows: (i) the archaeological analysis, which researched the finds from both atypical mass or individual graves, which had been filled in with ‘antiseptic’ white gravel; (ii) paleo-anthropological analysis which considered the alterations caused in the bone material of the epidemic’s victims, and (iii) paleo-genetic analysis using DNA results to determine the medical cause of death. Further development of this tripartite approach may provide additional insights into the underlying causes of medieval epidemics in Russia.

03 BIOARCHAEOLOGY OF CARE FOR LEPERS IN THE MIDDLE AGES

Author(s): Guillon, Mark (Institut National de recherches en Archéologie Préventive)

Presentation Format: Oral

If the caring of the sick was dependant on charity in the past, today it is dependant on human rights. For a long time lepers were excluded from society and they often still are and it is interesting to study the manner by which the valid cared for the leper community, the border between who is deemed as sick and who is healthy not always being very clear. In the Middle Ages, these communities were well identified and lived apart from the rest of society and historical research has largely contributed to understanding the organization of these groups. Funerary archaeology provides a different approach to the function of leper-houses that includes varied aspects such as the general layout of the buildings, how the corpses were buried and also the readable signs of the disease on the skeletons. Do these sources make it possible to apprehend how these communities were organized? Is it possible to understand the relations between members of the community through the establishments organization, how the burials were organized and through anthropological study? Using examples, we propose to illustrate this joint source approach by developing in particular the funerary and biological aspects and their specific contributions in the understanding the concept of exclusion of leprous communities.

04 OSTEOLOGICAL AND STABLE ISOTOPIC ANALYSIS OF THE INDIVIDUALS FROM THE 12TH CENTURY UNEARTHED IN THE HOSPITAL OF SANT LLÀTZER, BARCELONA

Author(s): Montes, Núria (Grup de Recerca Aplicada al Patrimoni Cultural - GRAPAC. Unitat d'Antropologia Biològica; Departament de Biologia Animal, Biologia Vegetal i Ecologia; Universitat Autònoma de Barcelona) - Jáuregui, Clara (Independent researcher) - Dinarès, Rosa (Hospital Universitari General de Catalunya) - Subirà, Maria Eulàlia (Grup de Recerca Aplicada al Patrimoni Cultural - GRAPAC. Unitat d'Antropologia Biològica; Departament de Biologia Animal, Biologia Vegetal i Ecologia; Universitat Autònoma de Barcelona)

Presentation Format: Oral

The hospital of Sant Llätzer was established in the 12th century on the verge of the city of Barcelona, to shelter those suffering from leprosy. An exceptional documentary collection provides details about the diet of the patients, the purchases of the hospital and the incoming patients during the 14th century, but fewer textual sources have been preserved from the former centuries of activity in the hospital. The archaeological tasks in the surrounding area of the chapel of Sant Llätzer have provided new data on the hospital, which may help fill the existing gap on the history of leprosy in Barcelona. About 80 individuals were recovered from the cemetery, with a chronology that extends from the 12th to the 18th centuries.

We carried out the osteological analysis of the human remains recovered from the 12 burials corresponding to the 12th century. For the retrospective diagnosis of leprosy, the methods established by Boldsen and Freund (2006), Andersen and Manchester (1992), Ortner (2008) and Matos (2009) were used. When necessary, a radiological analysis and a CT scan were also carried out. Bone samples were taken from these 12 individuals and 7 animals from the same cemetery for the analysis of stable isotope composition of carbon and nitrogen ($\delta^{13}C$, $\delta^{15}N$), in order to analyze possible differences in dietary patterns.

Rhinomaxillary changes and/or concentric remodeling of hand and foot bones were observed in five individuals. The remaining individuals showed different sets of lesions. The $\delta^{13}C$ values showed that the protein intake was mainly of terrestrial origin in this

group, while the $\delta^{15}\text{N}$ values are more heterogeneous, suggesting that the observed differences in diet were due to a distinct intake of animal protein.

05 MAPPING MEDIEVAL MALARIA. NEW WAYS OF STUDYING A NEGLECTED DISEASE IN THE NETHERLANDS

Author(s): Schats, Rachel (Leiden University)

Presentation Format: Oral

Malaria is known to have had—and still has—a massive impact on health. The disease is associated with debilitating symptoms such as fevers, muscle pains, and severe anaemia, incapacitating entire populations. Although currently absent in the Netherlands, written records indicate that the disease was endemic here from the 17th to the mid-20th century, mainly in the coastal regions. Since the medieval environmental circumstances, with its abundance of brackish water, would have created the perfect breeding ground for the mosquito transmitting malaria, the disease could have been a health problem of epidemic proportions. The paucity of historical information concerning disease in this period however means that malaria is only rarely included in discussions on medieval health, hampering our interpretations of past societies. Gaining a better understanding of malaria in the medieval period is therefore essential.

This paper will discuss a new approach to studying malaria. Recent developments in osteoarchaeology allow for an assessment of the disease in skeletal remains. Several palaeopathological studies suggest that a skeletal indicator of anaemia, termed *cribra orbitalia*, can be used as a marker for malaria in the archaeological record. Although *cribra orbitalia* is commonly viewed as a non-specific stress marker, there appears to be a strong correlation between this orbital pathology and malaria. This paper will elaborate upon the results of a pilot study exploring the relationship between *cribra orbitalia* and potential malarial areas in the medieval period in the Netherlands. The findings demonstrate that *cribra orbitalia* was significantly more common in regions identified as malarial, suggesting that the disease was likely to be an important illness in the medieval period in certain areas. The results of this study show that it is crucial that malaria is included in discussions of medieval health to forward our interpretations of past society.

06 DEFINING EPIDEMIOLOGICAL CHARACTERISTICS BY STUDYING THE PALAEODEMOGRAPHY OF THREE MULTIPLE BURIALS FROM STANS, SWITZERLAND

Author(s): Somers, Joke (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Alterauge, Amelie (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Fetz, Hermann (Archaeological Service of the Canton Luzern and Nidwalden) - Keller, Marcel (Max Planck Institute for the Science of Human History, Jena) - Löscher, Sandra (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern)

Presentation Format: Oral

The study of multiple burials within communal medieval and early modern cemeteries has long been neglected. Especially the use of this burial type as a way to deal with simultaneous deaths during epidemics or war has become an important topic of research. An excavation in Stans in central Switzerland recently revealed parts of a cemetery associated with the parish church. A total of 168 individuals were recovered dating between the 8th and 19th centuries. Within the cemetery three multiple burials could be identified which were radiocarbon dated to the 15th-17th centuries. By studying the individuals interred in these three complexes, the aim of this study is to get a better understanding of epidemic events, define their characteristics and finally identify the cause of these multiple deaths. The skeletons showed no signs of trauma or any other diagnostic pathological lesions and were deposited simultaneously. The results demonstrate a demographic profile with an absence of neonates and an overrepresentation of young children, adolescents, and young adults. Additionally, there is a higher number of male individuals deposited in these graves. This mortality profile differs from one expected in case of natural mortality with a selective composition in terms of age and sex suggesting an epidemic event. Furthermore, plague mortality appears to have a distinct demographic signature and the skeletal assemblage concurs with the epidemiological characteristics of this disease. The historical sources suggest an association of the multiple burials with plague, since Stans was repeatedly struck by plague epidemics. Nevertheless, aDNA analysis should be conducted to confirm this theory and verify the plague as probable causes of death.

07 PLAGUE AND PESTILENCE IN MEDIEVAL DENMARK: GENOME SEQUENCING OF HISTORICAL YERSINIA PESTIS

Author(s): Eaton, Katherine (McMaster University) - Gamble, Julia (University of Toronto) - Boldsen, Jesper (University of Southern Denmark, ADBOU) - Poinar, Hendrik (McMaster University)

Presentation Format: Oral

Pandemics of plague have emerged and re-emerged throughout human history with tremendous mortality and extensive geographic spread. Unfortunately, our ability to reconstruct the history of this infectious disease is limited due to a scarcity of surviving historical documentation and a lack of diagnostic skeletal manifestations. In response, novel interdisciplinary approaches aimed at studying the evolutionary history of the plague bacterium, *Yersinia pestis*, have revealed intriguing new discoveries. Of particular interest are the findings of previously undescribed reservoirs of disease persistence and dispersal events linking medieval strains to modern global epidemics. To further explore these patterns of disease persistence and dispersal connecting our past and present disease experience, this study presents the results of historical *Y. pestis* genome sequencing from medieval Denmark. Due to Denmark's

geographic position, it is hypothesized to be involved in the eastward back-migration of historic plague out of northwestern Europe into central Asia, thus serving as the ancestral source of many modern epidemics. We contextualize the Danish plague experience within large-scale processes of European migration, and at the individual level, by integrating molecular and paleopathological evidence through the interpretive framework of frailty in bioarchaeology. The combination of molecular and bioarchaeological methods offers a unique lens through which to reconstruct the fluctuating patterns of human connectivity and ecological interaction that have shaped our relationship with infectious disease.

08 YERSINIA PESTIS GENOMES RECOVERED FROM 14TH TO 17TH CENTURY PLAGUE BURIALS ELUCIDATE THE INITIATION AND PERSISTENCE OF THE SECOND PANDEMIC

Author(s): Keller, Marcel (Max Planck Institute for the Science of Human History, Jena; SNSB, State Collection for Anthropology and Palaeoanatomy, Munich) - Spyrou, Maria A. (Max Planck Institute for the Science of Human History, Jena) - Tukhbatova, Rezeda I. (Max Planck Institute for the Science of Human History, Jena; Center of Excellence „Archaeometry“, Kazan Federal University) - Walker, Don (MOLA - Museum of London Archaeology) - Castex, Dominique (PACEA, CNRS Institute, Université de Bordeaux) - Lösch, Sandra (Institute for Forensic Medicine, University of Bern) - Harbeck, Michaela (SNSB, State Collection for Anthropology and Palaeoanatomy, Munich) - Herbig, Alexander - Bos, Kirsten I. - Krause, Johannes (Max Planck Institute for the Science of Human History, Jena)

Presentation Format: Oral

Three historical pandemics are attributed to the bacterium *Yersinia pestis*, the causative agent of plague. The Black Death is regarded as the onset of the Second Pandemic, when based on historical accounts the pathogen caused the first outbreak in Crimea in 1347 and rapidly spread through large parts of Europe within the next six years, killing an estimated 60 % of the local population.

In the next centuries the disease repeatedly ravaged Europe until it vanished from the continent in the 18th century for reasons that are not sufficiently understood. Palaeogenetic studies have confirmed *Y. pestis* as a causative agent of the Black Death. More recent publications on whole genome reconstructions have linked multiple outbreaks of the Second Pandemic to a single lineage, thus suggesting the persistence of plague in a European reservoir for centuries. This contradicts results of climato-ecological studies that provide support for multiple re-introductions of the bacterium from Asia.

In this study, we aimed to increase the number of ancient genomes in a broad temporal and spatial window of the Second Pandemic to investigate the initial phase of the Black Death and the disputed persistence of this lineage in the following centuries.

We present over 30 *Y. pestis* genomes recovered from nine sites in five European countries spanning from the 14th to 17th century, vastly increasing the number of available genomes and filling gaps in the time transect of the Second Pandemic. Our data support an Eastern European entry of the pathogen, as well as low genetic diversity during the Black Death. In addition, our analysis of post-Black Death outbreaks suggests the subsequent persistence of plague in Europe, presumably with the establishment of more than one local animal reservoir.

09 ANIMALS AND THE BLACK DEATH: A CRISIS AND ITS CONSEQUENCES ON HUMAN-ANIMAL RELATIONSHIP

Author(s): Paxinos, Ptolemaios (Ludwig-Maximilians-Universität München)

Presentation Format: Oral

Along with the profound socioeconomic changes occurring in the 14th century in medieval Europe, husbandry practices were also being modified to fit new needs and new challenges. Archaeozoological research has the potential to reveal new non-documented aspects of the everyday life of medieval humans. How did people treat their animals in a period of crises? How can the archaeozoologist link evidenced changes in the faunal material to certain events such as the Black Death? Archaeozoological material from the Kölner Dom (High Cathedral of Saint Peter in Cologne) is presented as a case-study. The absolute chronology of the archaeological features allows us to demonstrate the short-time effects of the Black Death. Such findings can be further studied on a large scale, which put some of them into a greater perspective. The changes affected not only farm animals such as cattle, sheep, goat and pig, but also pets, such as cats. For the latter there seems to be a slight increase in numbers in the wake of the Black Death which can be interpreted in various ways. Since cats are very susceptible to *Yersinia pestis* it can be assumed that they died because of the plague. But people themselves can be regarded as responsible for the death of cats, since they associated them with the evil. Another explanation could be that cats died of natural causes and their greater numbers reflect their greater importance as rat and mice hunters. Although various explanations can be provided, it becomes apparent that dead animals can contribute to the better understanding of the events of the Black Death.

10 THE SOCIAL ARCHAEOLOGY OF THE BLACK DEATH: BEYOND THE PLAGUE PITS

Author(s): Inskip, Sarah - Robb, John (University of Cambridge)

Presentation Format: Oral

The archaeology of the Black Death has traditionally focused upon studying assemblages of the people who died during epidemics – at first grappling with the problem of identifying epidemic deaths and, much more recently, understanding what can be learned about processes such as selective mortality. While these remain important issues that are imperative in the understanding of immediate effects of disease, if we are to understand the role of epidemics in social history, we must go beyond these relatively short moments

of time and broaden our vista. For example, the social and biological consequences of epidemics are likely to be most visible not in people who died at the point of crises, but in survivors who lived in the world that had been conditioned by changed circumstances. Thus, paradoxically, plague pits are the exact place not to look to trace many of the social, historical and long term effects of epidemics. We illustrate this argument by consideration of the bioarchaeology of the Black Death (*Yersinia pestis*) epidemic of 1347-9. Specifically, we focus on various skeletal assemblage that originate from the Medieval City of Cambridge, including pre and post plague cemeteries and individuals from a variety of social and economic backgrounds.

419

MAGIC IN PREHISTORY

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Nimura, Courtney (Griffith University, Australia) - Gosden, Chris (University of Oxford)

Format: Regular session

Much thought has been given to subjects such as deliberate deposition, broader aspects of ritual, and art in studies of prehistory. Recently there has also been some related discussion of issues of animism, prehistoric ontologies, and notions of cause and effect. In this session, we would like to explore the idea that magic might better describe many prehistoric beliefs and practices. We see magic as taking a number of forms, which include, but are not restricted to: a broad belief in animism, which holds that many things are animate and purposeful; the possibility of action at a distance through so-called sympathetic magic, which attempts to cure ills or cause harm through acting on substances and materials that then affect people or other things; or attempts to manipulate time and space through divination, prophecy, or attempts to raise the dead. We welcome papers that take a broad theoretical approach to the concept of magic in prehistory, those that develop case studies, or papers with some combination of theoretical and empirical work.

ABSTRACTS

01

MAGIC AND PREHISTORIC MODELS OF CAUSE AND EFFECT

Author(s): Nimura, Courtney (Griffith University, Australia; University of Oxford) - Gosden, Chris (University of Oxford)

Presentation Format: Oral

All human societies have notions of how the world works – these have, in the past, included creation stories, myths, and fables. More recently, they have been discussed through ideas of ontologies. Of rather longer standing in archaeology is the use of the term ‘ritual’, which has been much criticized in recent years. In this paper, we argue that the idea of ritual is a weak reference to magic and that its generality has prevented any proper theoretical discussion of what a range of prehistoric actions might represent. We argue here that magic, in its relationship to what we might now term science and religion, is a useful way of understanding past models of causality and it can add some specificity to such models. We start by laying out a definition of magic that involves a human continuity with the powers of the world. We then move onto a series of examples, which will include Bronze Age rock art and so-called Celtic art, among others. This paper will also introduce the session by providing a sense of the range and variety of the papers to come, as well as highlighting some of the key themes and ideas that will be addressed.

02

PREHISTORIC METALLURGY BETWEEN MAGIC AND TECHNOLOGY

Author(s): Gošić, Milena (Department of Archaeology, University of Belgrade)

Presentation Format: Oral

The past decades have seen a growing interest in prehistoric metalworking throughout the Old World, driven by significant advances in archaeometry. However, considering that since the early days of archaeology, invention of metallurgy has been compared with industrial revolution, it is not surprising that little space has been left for magical and ritual aspects of metallurgy in archaeological interpretations. Emphasis of much of the research has been on the date and location of the earliest smelting or on the production optimization and economic values such an invention brought to past societies. Yet, it is not difficult to imagine the process of transforming ore, i.e. stone, into metal being understood as magical, especially by societies that had no previous access to metal, either smelted or native, as smelting is the first material transformation performed by man. Other pyrotechnologies, such as pottery and lime production, do change the properties of the materials, but to a far lesser extent. Also, the heat of a smelting furnace and various colors of flames rising from it, must have made an impression on the people who witnessed it.

The first aim of the proposed paper is to show that the dichotomy between magic and technology, which echoes the dichotomy of ritual and secular, is one rooted in recent western thought and is not necessarily applicable to other civilizations and societies, including prehistoric. The second aim is to present means for elucidating magical and ritual aspects of prehistoric metallurgy, which can, aside from analysis of ancient remains of production and finished artifacts, also include cross-cultural comparisons with known ethnohistorical examples of ritualized metallurgy.

03 MAGIC, LIMINAL RITUALS, AND NECROPHOBIA IN PREHISTORIC FRANCE: A COMPLEX APPROACH

Author(s): Gonzalez Alaña, Ian (Université Paul Valéry Montpellier- UMR5140 CNRS)

Presentation Format: Oral

The study of funerary practices in Prehistoric France has been changing for the last ten years. Nowadays, we know that Prehistoric individuals in Southern France were perfectly capable of performing complex rituals in a wide range of activities: Magic, divination, medicine, and funerary rituals are only a small part of the very complex structures in Prehistoric Ages.

From those examples, we will see how magic and funerary rituals could interact in the South of France, in Prehistoric Ages, especially in the Neolithic sphere. To this end, we will study some funerary practices that can be linked to the fear of the dead returning to harm the living. Necrophobia, which can be archaeologically validated, is one of the causes that made Prehistoric individuals to perform very specific and complex rituals, which can be found in various ways: body manipulation, specially post-mortem, the use of Apotropaic objects, or the treatment of the body can be considered as a few examples.

To study the link between Magic and Funerary remains towards Necrophobia, we will inspire on Morin's Complex Thought and transversality, using not only archaeology but also anthropology, ethnological analogies, and also philosophy. This global and Complex Method can be very useful to help us understand and study the intrications between Magic, archaeology, and Necrophobia.

04 THE MAGIC OF SMALL THINGS – 'STRUCTURED DEPOSITION' IN THE EARLY NEOLITHIC LINEARBANDKERAMIK

Author(s): Hofmann, Daniela (Hamburg University)

Presentation Format: Oral

The magic of small things – 'structured deposition' in the early Neolithic Linearbandkeramik

The Neolithic Linearbandkeramik culture (or LBK) is generally not discussed from the point of view of its spiritual beliefs. At most, researchers have tackled such themes in relation to the human body and its treatment. Yet it seems likely that the magical or apotropaic was also interwoven in daily life, where it may have left material traces. This paper gives an initial overview of depositional acts which can be classified as 'structured' to some degree, and which have been recovered from varied contexts (postholes, settlement pits, landscape features) across the LBK's distribution. While some of these, such as hoards of axes or grinding stones, have been discussed in terms of social strategies (aggrandisement, destruction of wealth) or in functional terms (raw material storage), there are many residual examples which do not fit even these loose categories and have therefore been treated with some suspicion. They can contain a variety of mundane, used or even broken things in more or less carefully placed constellations. This paper discusses whether such 'fuzzier' deposits could not best be described as the residues of magical practices in the widest sense, combining substances with specific known qualities and burying them in auspicious locations to achieve very personal and diverse ends.

05 ANCIENT FUNERARY MOUNDS AND TRADITIONAL MASTER SPIRITS OF THE PLACE: ANIMATED LANDSCAPES IN THE MONGOLIAN ALTAI

Author(s): Dal Zovo, Cecilia (Incipit-CSIC; Institute of Turkic Studies, Freie Universität Berlin)

Presentation Format: Oral

The original conception of magic is well attested in classical Greek and Iranian sources, where magi could be dream-interpreters, soothsayers, and, more in general, specialists in ritual practices, funerary functions, livestock sacrifices, and cultic libations, markedly to rivers and mountains. Although more refined chronological and etymological considerations may lead to a speculative ground, it is quite significant that the Proto-Indo-European root, *magh- apparently expressed the idea of power, or ability; while later derivations also conveyed the meaning of both gift and sacrifice. But how, one may wonder, can these semantic values combine with the analysis of ancient cosmologies and ceremonial practices in Bronze and Iron Age Eurasia? To which extent is it possible to trace their long-term persistence in ritual traditions and beliefs? In this paper, I analyse how in Mongolian Altaic cosmology and folklore the landscape is conceived as an animated whole, inhabited and controlled by master spirits of the place - gazriin ezed -. In fact, as Caroline Humphrey highlighted, the Mongolian landscape is locally seen as the context of interactions between humans and non-human forces, thus validating the essential role of powerful figures of intermediation between different worlds, and the performance of congruous ritual and funerary practices. Furthermore, here I comparatively explore how these concepts may enrich our understanding of the local archaeological landscape, especially in the sphere of Late Prehistoric funerary mounds: their liminal emplacement, cardinal orientation, possible associated rituals, and symbolic reference to ancient animated cosmologies and worldviews.

06 IRISH AND BRITISH PASSAGE TOMBS: DIVINATION AND AFTER-DEATH COMMUNICATIONS

Author(s): McVeigh, Thor (National University of Ireland Galway)

Presentation Format: Oral

In recent decades neuropsychological theory in conjunction with research on mind-body experiences and 'altered states of consciousness' has been utilized in studies investigating the acoustic properties of passage tombs and studies which link megalithic art and 'entoptic' phenomena. In most archaeoacoustic investigations of passage tombs explanations of why prehistoric peoples could or would have utilized the acoustic phenomena and aural properties produced, or the psychological and physiological responses they elicit, tend to be rather brief. In studies focused on 'entoptics' and megalithic art, explanations of why 'altered states of

consciousness' would have been sought within passage tombs gravitate towards rather generalized discussions of 'shamanism' or 'shamanic' practice, with interpretations centring around ambiguous explanations of 'otherworldly' contact. In an attempt to go beyond such general interpretations, this paper will investigate whether passage tomb architecture, art and contents could indicate utilization for 'divination' and 'after-death communications'. In the case of the former, both 'indirect divination' (the observation of signs) and 'inspired prophecy' (obtained only in a state other than regular waking consciousness) will be considered. The latter, 'after-death communications', has not been considered within passage tomb research previously, but recent neuropsychological research suggests that restricted sensory environments are particularly conducive to such experiences. 'After-death communications', which are distinct from but related to 'altered states of consciousness', are sometimes perceived as a form of 'ghost encounter', but are more appropriately defined as 'sense of presence' experiences. During these encounters individuals 'perceive contact' with deceased individuals, spirits, deities etc. and 'receive messages' through the perception of various phenomena which range from physical sensations to more cerebral experiences. Passage tombs undoubtedly had various functions beyond being locations of burial, but could prehistoric peoples have sought to elicit various psychological and physiological responses through and within these monuments for the purposes of 'divination' and 'after-death communications'?

07 MAGIC AND MATERIAL AGENCY IN BRONZE AGE BRITAIN

Author(s): Bruck, Joanna (University of Bristol)

Presentation Format: Oral

This paper will explore the role of a variety of magical objects and materials in the British Bronze Age. Bronze Age burials often include interesting 'natural' items, such as the fossil belemnite from Langton, East Yorkshire, or the golden eagle talons from Skilmafilly in Aberdeenshire, and sometimes these form components of assemblages that can be interpreted as the 'kits' of ritual specialists. Materials with unusual properties such as jet, amber and shale were employed to make beads and armlets displayed on the body at key rites of passage, while human and animal bone was crafted to create powerful objects: the bone whistle made from a human femur from Wilsford, Wiltshire, or the dagger pommel of sperm whale ivory from Forteviot in Perthshire hint that specific materials may have been chosen because of the potency of their animate origins. Here, we will explore some of the implications of such finds for Bronze Age conceptions of the cosmos and understandings of causation: they indicate that agency was located in a variety of objects and materials, and that human attempts to harness these powers could be a dangerous but productive process. Magical materials were not only associated with ritual specialists or those who held particular positions of power or authority in Bronze Age communities, however, for many such items were associated with children for whom they may have had particular apotropaic qualities.

08 TIME, CIRCUMSTANCE, AND...MAGIC? EXPLORING FORTUNE AND CONTINGENCY IN THE MATERIALS OF THE EURASIAN STEPPE BRONZE AGE

Author(s): Johnson, James (University of Copenhagen)

Presentation Format: Oral

The materials involved in sympathetic magic are often treated as timeless pieces reduced to that single purpose. By moving from this timeless perspective to one more incorporative of the multiple, relational temporalities of these materials, we can better understand how, and perhaps why, these materials or their symbols moved from a form of sympathetic magic to a sign form with otherworldly or supernatural connotations. In this paper, I explore not only how certain materials are incorporated symbolically into practices of sympathetic magic meant to influence or invoke a favorable outcome in periods of violent, inter-personal engagements, but their use within broader semiotic ideologies as icons and indices, as well as symbols, meant to influence broader audiences, with their magical or otherworldly properties codified as they became vibrant components in prehistoric cosmologies. To do this, I assess the contingencies involved in the materiality and temporalities of the chariot and spoked wheel as they moved from the southern Urals regions of the Eurasian steppe, c. 2100-1100 BC, to other regions such as the Mediterranean and northern Europe. I use Weberian notions of 'fortune' and Peircean semiotics to examine the symbolic potential and potency of the chariot and spoked wheel as they moved from socio-physical technologies to forms of sympathetic magic to cosmological symbols representing the divine and/or the divine right of leadership.

09 HUNTING MAGIC. IS IT MAGIC, OR JUST A PART OF THE HUNTING?

Author(s): Paczkowski, Michal (State Archaeological Museum in Warsaw)

Presentation Format: Oral

The so-called "hunting magic" appears in hunter societies around the world. Under this term, I understand a range of rituals, behaviors and objects which is not necessary for hunt itself, but they are an obvious element for hunters. But is there any possibility to answer the question what does that mean not for us, but for peoples in prehistory? In Northern Scandinavia we have unique possibility to analyse not only material remains of culture but also rock art. Moreover even with chronological doubts, we have possibility to compare it to material and material and spiritual culture of circumpolar societies. The other aspect of rock art, which is very important to study of hunting strategies in a more general sense, is realistic style of depicted scenes. Some of behaviors are a real part of hunting or hunting strategies and are necessary to achieve the final success (tracking, lurking, or herding) or the others are clearly symbolic (sticks, drums, dancing) but still they are inseparably connected with specific type of game. The same is with tools

and weapons used during the hunt. We have the “ordinary” ones like bow and arrows, harpoons, boat, skis, traps etc. and “magic” ones like elk head sticks.

10 THE BABY IN THE BRICK: DEATH, CONSTRUCTION AND MAGIC AT NEOLITHIC ÇATALHÖYÜK

Author(s): Kay, Kevin (University of Cambridge)

Presentation Format: Oral

This paper explores the role of magical deposition as a constructional technique: both as something that plays a role in physical architectural construction, and as something that, like architecture, creates and structures human interactions. My examples are drawn from the Neolithic tell at Çatalhöyük, a solid mass of ancient architecture that is permeated with a great variety of intentional material-cultural deposits. As Nakamura and Pels (2014) before me have pointed out, these deposits were made with special intensity at times when architecture was being actively made or modified, and may have played an integral role in the space-making process (see also Carter et al. 2015). Rather than segregating architectural practice and magical practice, I suggest that the combination of walls, floors, burials and embedded artefacts collectively articulated the moral and spatial parameters of social life, acting as what Graeber (2005) has called ‘gods in the process of construction’.

Paradoxically, much of this constructional magic was carried out with the outcomes of destruction and death: old tools, weathered feasting waste, obsidian debitage, and the bodies of dead infants. In this, too, magic was like construction itself at Çatalhöyük, which used the smashed remains of old houses for its foundations and the recovered timbers of previous structures for its supporting elements. Both intertwined practices, in other words, engaged people intensively with the unmaking and remaking of matter, the ending of one biography by embedding it in another’s beginning. I argue that it is precisely this process, and the practical, meaningful and moral tensions surrounding it, that drew magical and constructional concerns together at Çatalhöyük. In this way, ultimately, I seek to embed the concept of ‘magic’ in the Neolithic’s lived worlds, refuting the word’s longstanding association with the arcane and immaterial.

11 ELEMENTAL MAGIC IN MINOAN CRETE

Author(s): Tittl, Larissa (The University of Melbourne)

Presentation Format: Oral

Depositional practices in the caves of Minoan Crete have traditionally been connected to the worship and propitiation of deities associated with particular caves or with fertility and seasonal cycles in general. More recent scholarship explores the idea that depositional practices centre on rituals concerned with initiation or the marking of life-cycle changes, or with ancestor worship. While ‘ritual’ is a commonly used term, the word ‘magic’ is rare in this scholarship. But if magic can be thought of as a transformative practice, one that involves thoughts and actions directed towards changing one thing into another, or one that instigates changes within an existing being or object, can objects used as agents of transformation be thought of as magical? This paper will explore the notion that the depositional objects in Neopalatial caves were considered agents of transformation. Made from elements and substances – clay, metal, stone – that undergo significant transformation from raw material to workable substance to deposited object, these objects embody specific properties that provide direct links to the Minoan sacred landscape, a landscape comprised of fluid boundaries between states of being and between human and non-human agents. This is a kind of elemental magic that is worked through ritually charged objects within the transformative and liminal sacred space of the cave. The deposited objects, the cavescape and the emotionally charged ritual activity combine to provide a heightened sense of numinous power and a space within which human agents can negotiate their place in a realm shared with non-human agents.

12 THE PLACE OF “CONOPA” IN THE ANDEAN LATE HORIZON (1400 - 1532 AD)

Author(s): Siveroni, Viviana (Institute of Archaeology, UCL)

Presentation Format: Oral

This paper adds a third item to the ritual paraphernalia mostly discussed in the literature of Andean animism. Here, I focus on ceramic male and female miniatures commonly found in Late Horizon, LH, domestic sites along the Peruvian coast (1400 – 1532 AD). By looking at their general context as well as some references to figurines in documents of the “extirpacion de idolatrias” published by others, I see some of these at the centre of healing practices as well as fertility rituals. I then contemplate possible relationships between ethnographically documented “conopa,” “Capacocha” figurines, and ceramic miniatures. Ethnographic “conopas” — camelid or maize cob stone miniatures— are used in household level rituals of fertility and regeneration, and are considered to be a relic of Prehispanic ritual practices mostly linked to Late Horizon (LH) Inca camelid stone figurines. On the other hand, metal figurines of the “Capacocha” ceremonies reflect central concepts of Inca ontology and were key to integrating populations into the Inca world. All three reflect animism practices of different degrees. At first value, domestic ceramic miniatures show no evident links to “Capacocha” figurines. But is it possible to envisage some sort of connection? In the conclusions, I explore their local trajectories to sketch some possibilities.

a.**BONE-TEMPERED POTTERY OF THE TRB COMMUNITIES FROM THE POLISH LAND. A VIEW FROM KAŁDUS (N POLAND)****Author(s):** Adamczak, Kamil (Institute of Archaeology, Nicolaus Copernicus University in Torun)**Presentation Format:** Poster

Neolithic potters applied many types of admixtures for tempering the ceramic pastes. The selection of such agents as well as the changes of a trend of their employment in the past were strictly dependent on the local pottery traditions. However, some of the technological choices being made during manufacturing the vessels could have been influenced by foreign patterns. This might result in adopting new technological customs (e.g. admixture) by the local communities. The Funnel Beaker culture (TRB) potters from the Polish land (4100/4000-3300/3100BC) applied mainly grog, which they obtained from broken and crushed vessels. As regards the TRB communities from northern Poland, the essential role of the crushed bivalve shells must be emphasized. Whereas the sand was commonly employed by TRB potters, the organic and mineral (heated and crushed stones) admixtures were of less significance. The crushed and burnt bones are another group, which may be distinguished from a spectrum of the admixtures applied by the TRB potters. The bone admixture was not frequently used, but what is more important, it did not have impact on technological properties of the ceramics actually. Hence, it may reflect the pottery ritualization. This work presents the results of a multidisciplinary approach to the collection of the bone-tempered ceramic vessels recovered from the TRB settlement in Kałdus (N Poland). The main goal of the research was to investigate whether the presence of the bone fragments in the vessels from Kałdus was a deliberate treatment applied by the TRB potters. Also, the research was aimed to follow the TRB pottery manufacturing praxis, concerning its technological and symbolical dimensions. Therefore, the research involved the employment of the mineral-petrographic analysis coupled with spectral (LA-ICP-MS, SEM-EDS, γ -ray spectroscopy) and INAA analyses. For species identification, some of the bone particles were analyzed with the use of a microCT.

420**SENSITIVITY AND RESILIENCE OF HUMAN COMMUNITIES TO COASTAL ENVIRONMENTAL CHANGES DURING THE EARLY TO MID-HOLOCENE****Theme:** Theories and methods in archaeological sciences**Organisers:** Brisset, Elodie (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili - URV) - Dupont, Catherine (CNRS UMR 6566 CReAAH, Université of Rennes 1) - Burjachs, Francesc (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili - URV; ICREA)**Format:** Regular session

Over the past years, Early to Mid-Holocene coastal adaptation studies have emerged as a key research topic to understand processes of economic intensification and human resilience to environmental change. As the sea level rose during the Lateglacial Interstadial coastal configuration dramatically changed, inducing sedimentary infilling of estuaries and bays. Those sea-level changes were translated into loss of human settlement areas, reduction of hunting territories, and modification of coastal biotopes. A key debated issue, is to determine to what extent Early to Mid-Holocene changes on coastal biotopes and marine biological productivity affected patterns of human exploitation of coastal resources.

This session aims to present new multidisciplinary findings that include:

- Archaeological records of the Mesolithic and Neolithic periods both in terms of change in settlement distribution over time along coasts and hinterlands, and past dietaries (bioarchaeological remains of animals -invertebrates and vertebrates- as well as geochemical analysis);
- Paleogeographical studies recording geosystem adjustment to sea-level rise (multiple-core analysis, 3D modelling, time-slice reconstruction);
- Paleoeological studies focussing in coastal biotope reconstructions (palynology, aquatic fauna, geochemical analysis);
- Spatial and temporal correlations between archaeological and palaeoenvironmental records of the socio-ecosystem changes;
- Comparisons of European coastal areas (Mediterranean, Atlantic, Baltic, Black Sea) in order to highlight similarities and discrepancies.

Thus, we encourage participation of researchers that are interested in understanding of past human-coastal environment feedbacks during the Early to Mid-Holocene. Ultimately, this session aims to take benefit of past evidences in order to better understand resilience of societies to current global changes.

01 LONG-TERM CONSUMPTION OF MARINE RESOURCES DURING THE FINAL PLISTOCENE- EARLY HOLOCENE IN COVA FORADADA (XÀBIA, MARINA ALTA): CHANGES AND RECURRENCES

Author(s): Verdún-Castelló, Ester (Aix-Marseille Université) - Casabó i Bernad, Josep (Conselleria d'Educació, Investigació, Cultura i Esport. Direcció Territorial de Castelló)

Presentation Format: Oral

Cova Foradada is an archaeological site located in a cliff in the cape of Sant Antoni in the Mediterranean coast of the Iberian Peninsula (Xàbia, Marina Alta). Nowadays it is located at 40mamsl. The site was occupied discontinuously since the Early Upper Paleolithic (EUP) (39,494±1012 cal BP) to recent times (384±57 cal BP) (Casabó i Bernad, 1997 & 2014). The stratigraphic sequence and the low quantity of remains suggest punctual short occupation events of the cave which occur far apart in time. During the first occupations of the site (EUP), the cave was located at c. 4km. This distance decreased in the Holocene due to the rising of the sea level.

Marine molluscs have been recorded along all the stratigraphic sequence, nevertheless there are some significant differences between the results obtained from the Pleistocenic and the Holocenic archaeological levels. In the archaeological levels IV, V and II which all of them correspond to the Pleistocene (34,245±164 cal BP- 24,612±254 cal BP) a high diversity of marine taxa has been recorded, however the majority of them are represented by few individuals (in many cases, just one). The presence of different species from rocky shores and sandy/gravel shores has been documented but the most important species are mussels (*Mytilus galloprovincialis* Lamarck 1819), limpets (*Patella* sp. Linnaeus, 1758) and top snails (*Phorcus* sp. Risso 1826). In the Holocenic level (III) (7,010±172) the taxonomic diversity decreased and the most abundant taxa are limpets and top snails. The presence of mussels in this level is much lower. Although there are few taxa from sandy/gravel shores, the most abundant species live in rocky shores.

Both in the Pleistocenic and in the Holocenic levels molluscs used as ornaments have been documented, however they are much more abundant in the EUP levels.

02 RECONSTRUCTION AND IMPACT OF SEASCAPE EVOLUTION ON HUMAN COMMUNITIES DURING THE MESOLITHIC-NEOLITHIC TRANSITION IN THE MEDITERRANEAN IBERIA

Author(s): Brisset, Elodie - Fernández-López de Pablo, Javier - Burjachs, Francesc (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili - URV)

Presentation Format: Oral

The study of past interactions between hunter-gatherer communities and coastal environment is of major interest because this period was characterised by a rapid sea-level rise following the Deglaciation. Here we present a study case of Pego-Oliva (Eastern Spain), an area which provides a thick Early-middle Holocene sedimentary infill, together with an extended Mesolithic sequence (El Collado site). Both records provide an unique opportunity to address how the Early Holocene sea level the reduction of coastal plains and the modification of coastal biotopes affected human settlement patterns during the Mesolithic period and the Mesolithic-Neolithic transition.

New fieldwork in the Pego-Oliva lagoon has been carried out in the context of the research project MedCoRes (H2020-MSCA-IF-2015 Ref. 704822). An extensive sampling strategy, based on 3 transects of 16 boreholes covering the Holocene sedimentary infilling, has been implemented together with sedimentological (lithostratigraphy, grain-size, LOI, dry density), and chronostratigraphic analyses (14C dates). This work has allowed to reconstruct three main phases of the morphogenetic evolution: First, from 9800 to 8200 cal. BP, the retrogradational architecture is characterised by four steps of shallow inner lagoon environments associated to sand barriers. Then, from 8200 to 7000 cal. BP, the continuous and rapid backward migration of the shoreline reached its maximal inland position leading to the disappearance of former inner lagoons. Finally, since 7000 cal. BP, sea-level stabilisation promoted the barrier construction leading to formation of an inner coastal lagoon isolated of the sea.

Finally, based on paleogeographical reconstructions and radiocarbon modelling we estimated that horizontal inland migration of the coastline reached rates of ~150 m per 50 years. Those results are compared to the Bayesian chronostratigraphy and bio-archaeological assemblages of El Collado. Altogether, our results show synchronic changes of coastal palaeoenvironments and subsistence patterns, arguing that new strategies have been essential to adapt to highly changing landscapes.

03 AS A LIMPET ON ITS ROCK! INSULAR MESOLITHIC AND NEOLITHIC POPULATIONS ALONG THE FRENCH ATLANTIC FAÇADE

Author(s): Dupont, Catherine (CNRS; Rennes University, France)

Presentation Format: Oral

Along the European Atlantic façade, the discovery and conservation of Mesolithic shell-middens or shelly layers are linked to the slowing down of the increase of the sea level. In France we have the chance to observe both island settlements and coastal ones. Their comparison is interesting because we can imagine that insular populations can be more dependent on marine resources than coastal continental ones. After archaeomalacological analysis (from food to ornaments...), the result is surprising: Mesolithic people have clearly exploited all the accessible resources in the vicinity of the site. The coastal continental shell-middens are similar to pure insular ones with a perfect knowledge of hidden recesses of seashores.

What about Neolithic populations? Isotopic analyses on human skeletal show that Neolithic people turned the back on the sea. If it is true for coastal continental populations, the scenario is less clear for insular people. After archaeomalacological analysis made on shells we will show this difference.

We will also see that to exploit the sea during the Mesolithic or the Neolithic is not only linked to the accessibility of resources. The seashore is like a fridge that you open only when you need and clearly Neolithic people are less dependent to seafood. The notion of territoriality is also interesting because the limited consumption of marine resources can also be linked to the access to the seashore. The Neolithic bays exploited on French coasts are interesting for this topic because you did not have access to the same resources if you live on the sheltered or exposed area of these part of the coastline.

04 A MATTER OF PERSPECTIVE RESPONSES TO LANDSCAPE CHANGES IN THE OSLO FJORD AREA DURING THE MESOLITHIC

Author(s): Mjaerum, Axel (Museum of Cultural History, University of Oslo)

Presentation Format: Oral

Deglaciation, volcanic eruptions, tsunamis and oceanic shifts during the Early and Mid-Holocene had a major impact on human life. Within the last decade, several studies have made important new insights into how strongly these natural forces affected human life on a large scale. The degree of environmental influence at a micro-level of individuals, households and groups, however, has been studied to a lesser extent.

A large Post-glacial rebound at the Oslo fjord in Norway resulted in the appearance and disappearance of small islands and inlets during the Early and Mid-Holocene. On a micro level, this occasionally caused dramatic changes in the availability of resources. The large settlements by the strait of Havsjødalen were positioned by a tidal current c. 5000 BC. Around 200 years later, this environmental hotspot disappeared due to land rising.

This paper examines the relation between humans and their environment through a micro-perspective, emphasizing the impact of environmental upheavals on household and groups in everyday life of the Mesolithic at Havsjødalen. These results are further compared with a macro-perspective based upon collected data from c. 500 Mesolithic sites at the interior of the Oslo Fjord. By applying a dualistic approach, my objective is to achieve a thick description of the impact of changing landscapes in the past. This enables a better understanding of how these landscapes affected human society and in what way this became embodied by the material culture of the Mesolithic people in the Oslo fjord.

05 FROM COAST TO HINTERLAND IN THE EASTERN NORWEGIAN MESOLITHIC: SPATIO-TEMPORAL ASPECTS OF THE LAND-UPLIFT AND THEIR IMPACT ON HUNTER-GATHERER COMMUNITIES

Author(s): Schülke, Almut (Museum of Cultural History University of Oslo)

Presentation Format: Oral

While many European coastal areas were transgressed in the Early and Mid-Holocene and thus not only destroyed for human settlement but also changed in terms of coastal biotopes, the situation in parts of Scandinavia, namely in Eastern Norway was reverse: Here constant land-uplift during all of the Holocene has preserved Stone Age sites on dry land. The impact of these geological processes, which not only brought along altered coastlines, but also led to a, in some areas immense, growth of hinterland areas, have not been studied on a more general plan and with a long-term perspective. This talk will deal with the potential of studying these relief changes in the Oslo-fjord region in a long-term perspective, and will explore how these might have changed people's environment, and thus their possibilities for living, moving and dwelling in the region at certain times. A first step for understanding these spatio-temporal changes, which in the future will need focused interdisciplinary studies, is the attempt to combine the locally different sea-level curves with topographic data from the region, to identify prominent changes in the environment of certain areas at different times. Understanding these immense changes and their impact on human populations is an important backdrop for the study of cultural development, economic strategies and social practices of the Scandinavian Mesolithic.

06 RAW MATERIALS, BROAD BLADES AND BEACHES: THE ARCHAEOLOGY OF THE EARLY HUMAN OCCUPATION OF SCOTLAND'S NORTH-WEST COAST

Author(s): Hardy, Karen (ICREA; Universitat Autònoma de Barcelona)

Presentation Format: Oral

The Mesolithic of Scotland's north-west coast is well known, largely due to the C19 discovery of several shell middens around Oban. Yet, the early occupation of this region which was, until around 8000 years ago, part of the north-west facing edge of the European continent, is more complex than this. Recently, several sites have been found to contain evidence from the late glacial and very early Holocene. All of these sites have been found on the coast; in two cases, in the intertidal zone, and in one case, rolled artefacts have been recovered from a raised storm beach, suggesting the original site was in a location that is today, offshore. There is a distinction between raw materials used before the late Mesolithic, as bloodstone from the island of Rum does not feature in the assemblages from the earlier periods. While evidence from the later Mesolithic is abundant and clearly shows a coastal and maritime focus, both in terms of resource use and travel, evidence from the earlier periods is less clear. The sea level reconstructions in the region are very limited but it is likely that some of the early 'coastal' sites were in fact at some distance from the sea. An example is the site at South

Cuidrach, Isle of Skye, where, though the material was recovered on the shore and was most probably originally from an area that is now underwater, artefacts suggest a cultural connection to terrestrial hunters. Here, I will discuss the varying different pieces of evidence for the earliest occupation of Scotland's north-west coast and attempt to unravel the various features of this earliest period.

07 SOCIOECOLOGY AND CLIMATE EVENTS DURING THE HOLOCENE IN THE EAST OF IBERIAN PENINSULA.

Author(s): Burjachs, Francesc (ICREA - Institució Catalana de Recerca i Estudis Avançats; IPHES - Institut Català de Paleoeologia Humana i Evolució Social; URV - Universitat Rovira i Virgili) - Mesquita-Joanes, Francesc - Marco-Barba, Javier (ICBIBE - Cavanilles Institute of Biodiversity and Evolutionary Biology, University of Valencia) - Reed, Jane M. (Dep. Geography and Geology, School of Environmental Sciences, University of Hull) - Santisteban, Carlos - Usera, Juan - Guillem, Jordi - Alberola, Carmen (Dep. of Botany and Geology, University of Valencia) - Expósito-Barea, Isabel (IPHES - Institut Català de Paleoeologia Humana i Evolució Social; URV - Universitat Rovira i Virgili) - Patchett, Frances (Dep. Geography and Geology, School of Environmental Sciences, University of Hull)

Presentation Format: Oral

The Albufera de València coastal lagoon is one of the largest oligohaline lakes in the Iberian Peninsula. Highly polluted and threatened by urbanization plans, it was protected as a Natural Park in the 80's to preserve its environment and surroundings, mostly consisting of rice fields and a forested coastal sand bar. Until recent studies, little was known about palaeoenvironmental history of this wetland. To improve this knowledge, we analysed the lake Holocene evolution based on sedimentology, geochemistry, and microfossils (foraminifera, diatoms, ostracod, and pollen remains) from two cores. One collected in the sand bar, and other from the central part of the lake. These sequences, together with previous works, show that the lagoon has remained brackish for most of its history since 8700 cal BP, regularly punctuated with freshwater from 7000 to 3400 cal BP. Episodes of decline in abundance of aquatic microfossils seem to match cold-aridity events Bond 5 (8.2 event, deadline for the last hunter-gatherers), B4 and B3 (4.2 event, Neolithic transition to Early Bronze Age). Also, Minorca events M8, M7 (marking the switch from a dominance of arboreal vegetation to grasses and onset establishment of the first farmer-shepherds), M6, M5, M4 and M3, and Alborán events (AC3 and AC2) in Western Mediterranean areas. These aridity events represent a lack of resources for prehistoric societies and are often correlated with declines of the population over the territory. The evolution of this lagoon will be correlated with the coastal fauna resources found in the archaeological sites of the region.

08 HUMAN BEHAVIOURS AND CLIMATE EVENTS: HOW CONFIDENT ARE WE ABOUT THE EFFECT OF EVENT 8.2KA OVER HUMAN BEHAVIOURS?

Author(s): Araújo, Ana Cristina (Archaeosciences Laboratory - LARC - of the Directorate General for Cultural Heritage - DGPC; Research Centre for Biodiversity and Genetic Resources - CIBIO/InBIO; Centro de Arqueologia da Universidade de Lisboa - UNIARQ) - Costa, Ana Maria (Archaeosciences Laboratory - LARC - of the Directorate General for Cultural Heritage - DGPC; Research Centre for Biodiversity and Genetic Resources - CIBIO/InBIO; Instituto Dom Luiz - IDL, Lisbon University; IIIIPC, Cantabria University) - Costas, Susana (Centre for Marine and Environmental Research - CIMA, University of Algarve) - Naughton, Filipa (Portuguese Institute for Sea and Atmosphere - IPMA; Centre of Marine Sciences - CCMAR)

Presentation Format: Oral

The 8.2 climate event has been repeated times invoked to explain changes in human behaviour of the last hunter-gatherer societies of SW Iberia. These changes, observed in settlement, technology, funerary practices and diets, mark in the Portuguese Archaeology the transition to the Late Mesolithic (c. 8400-7000 cal BP).

During the Early Mesolithic (c. 11500-8400 cal BP) the majority of sites are scattered along the present coast and correspond to shell middens devoted to the exploitation and direct consumption of marine resources, mostly molluscs. They were accumulated by very mobile groups organised in small familial units. Somewhere in time, in the transition to the Middle Holocene, this scenario seems to change radically. People leave the coast to occupy the inner part of the recently inundated estuaries of the Portuguese rivers as a consequence of the Holocene transgression, being the sites clustered in these ecotonal areas. These also correspond to shell middens but often present funerary areas with numerous human burials. A semi-permanent lifestyle is frequently used to characterize these communities.

It has been argued in the literature that these behavioural changes derived from the 8.2ka cold event. Among others factors, low oceanic productivity, severe climate conditions along the coast, sea-level rise and consequent changes on coastal morphology are frequently cited as key elements to explain the abandonment of the littoral by hunter-gatherer communities and the related reorganisation of human settlement, leading to the origin of the Late Mesolithic.

We present a critical review of the available data, considering both the archaeological and the palaeoenvironmental records, exploring alternative hypothesis to explain the origin of such behavioural changes.

REGIONAL CLIMATIC AND SOCIAL TRANSFORMATIONS DURING THE 4.2 KA BP EVENT IN THE SOUTHERN IBERIAN PENINSULA

Author(s): Weinelt, Mara (Graduate School Human Development in Landscapes CAU Kiel) - Schirmacher, Julien (Institut für Geowissenschaften CAU Kiel) - Kneisel, Jutta - Hinz, Martin (Institut für Ur- und Frühgeschichte CAU Kiel)

Presentation Format: Oral

Within the F1 project of the CRC 1266 'Scales of Transformation' we are investigating the 4.2 ka BP event in the western Mediterranean and its influence on the transformation of societies at the major cultural transition from a Neolithic/Chalcolithic configuration towards the Bronze Age.

Hereby the local timing and magnitude of the climatic oscillation during the event and the intensity and character of the societal change by quantification of the archaeological record are in focus. The intent is to correlate both proxies and to test if and to what extent the climate may have triggered and influenced developments in the human sphere.

Geochemical analyses of long chained n-alkanes and alkenones from a marine sedimentary archive (ODP-161-976A) from the Alboran Sea are taken out in order to investigate changes in precipitation, vegetation dynamics and sea surface temperatures. We combine this record with an estimation of the demographic development, which we obtain with the help of summed 14C data and aoristics.

Our recent results indicate two prominent arid periods centred around 4.0 ka BP and 4.25 ka BP interrupted by more humid conditions. Furthermore, we found a correlation between the development of precipitation and demographic proxies. It is also evident that the settlement structures changed in the course of the climatic shift.

Still a finer chronological resolution is desirable for both climatological and archaeological proxies. Nevertheless, it is already possible to examine the hypothesis of early statehood on the Iberian Peninsula in a more differentiated way than before by taking into account the changed environmental conditions and a detailed and quantitative description of large transformations in the social sphere.

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BETWEEN THE WINTER STORM SURGES - MESOLITHIC HABITATION ON A GROWING BEACH RIDGE AT THE ISLAND OF FLEMSØYA, WESTERN NORWAY

Author(s): Tøssebro, Christine (University Museum of Bergen) - Bondevik, Stein (Western Norway University of Applied Sciences) - Klungseth Lødøen, Trond - Årskog, Hanne (University Museum of Bergen)

Presentation Format: Poster

The Tapes beach ridge formed by the Mid-Holocene transgression maximum is a well-developed landform and well represented at archipelagos and islands along the coast of Western Norway.

Archaeological and natural scientific investigations at the site Longva have documented Late Mesolithic occupation on the Tapes beach ridge during the last phase of its development, between 7000-5200 14C yr BP. Consistent amounts of archaeological material, such as artefacts, structures and anthropogenic sediments, have been deposited in, and partly imbedded in, beach gravel on the distal side of the beach ridge. In this poster we suggest that Mesolithic habitation took place at the site during summer season, leaving cultural remains and deposits for later disturbance by winter storm waves that tossed beach gravel over the ridge and affected the cultural layers. Amongst the most significant of these prehistoric remains are hearths, dwelling depressions, some containing birch bark from possible floor of tents/huts, a quartz depository and middens containing charcoal, decomposed organic waste and numerous waste flakes and lithic tools. No cultural remains were found below the Tapes beach ridge.

Within archaeological research, dealing with issues associated with postglacial shoreline development, most researchers seem to be occupied either with explicit transgressions of sites or with sites unaffected by such processes. Here, however, we present results from an archeological investigation indicating that habitation is coeval with the accumulation of the ridge itself, and seem to indicate Mesolithic occupation on the beach ridge as the ridge was forming during the sea level high stand. We will present and discuss the quaternary-geological and anthropogenic processes that formed the beach ridge at Longva.

QUERNS AND MILLS IN MEDITERRANEAN ANTIQUITY: TRADITION AND INNOVATION DURING THE FIRST MILLENNIUM BC

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Alonso, Natàlia (University of Lleida) - Jaccottey, Luc (INRAP Grand Est Sud, Besançon) - Anderson, Timothy J. (LARHRA, UMR 5190, Grenoble)

Format: Regular session

After thousands of years of exclusive use of saddle querns for grinding grain, a series of more sophisticated mills appeared and evolved in the Mediterranean during the first millennium BC. The first consisted of exceptional variations of saddle querns that emerged in the initial centuries of the first millennium BC. Yet the phenomenon of change and innovation developed later toward the middle of the millennium with

the introduction of numerous new mill types such as the rotary quern, the Olynthus mill, the Iberian rotary pushing mill, the Morgantina mill, the Pompeian mill, the ring mill or the Delian mill.

The interest of this session is therefore to offer an overview of the latest research of specialists who are currently analysing grinding systems in the Iron Age and the beginnings of Antiquity. Although the historical circumstances in this period differ between the Eastern and Western Mediterranean, it is precisely the second half of the millennium that saw the expansion of the influences from the colonial world and an interaction, or lack of, between the different cultures.

The new more complex grinding mechanisms introduced in the first millennium BC represent a turning point in the history of milling and processing cereals. Yet many issues remain unclear as to the causes of the introduction of these mills and their socioeconomic repercussions, as well as the evolution and expansion of the different mill types, their raw materials and their diffusion.

ABSTRACTS

01 GEOCHEMICAL PROVENANCE ANALYSES OF VOLCANIC ROCK QUERNS AND MILLSTONES IN THE MEDITERRANEAN: APPROACHES, POSSIBILITIES AND LIMITS

Author(s): Gluhak, Tatjana (Römisch-Germanisches Zentralmuseum) - Schwall, Christoph (Österreichische Akademie der Wissenschaften)

Presentation Format: Oral

The analyses of the development of milling techniques can be greatly supported by the determination of the provenance of the tools, especially when innovative types of mills occur in a region where this specific technique was previously uncommon. The great potential to determine the provenance of querns and millstones especially produced from volcanic materials, based on their geochemical composition, by now is well known. Geochemical provenance determinations of volcanic rock querns and millstones in the Mediterranean benefit from the complex geodynamic setting of the Mediterranean region, which causes specific geochemical characteristics of the volcanic products in different regions. In rough terms, the geodynamic processes resulted in different mantle source conditions and produced a wide range of geochemically distinct magmas, which can be typical for certain locations. These geochemical characteristics may serve as markers for provenance determinations of the grinding- and millstones. In the past, several studies have been published which recommend certain element ratios to discriminate the different regions for millstone provenance analyses, down to specific islands. However, from a geological point of view the applicability of some of these plots has to be checked carefully. Furthermore, in contrast to these recommendations, more recently published geochemical data show that there are many cases in which the origin determination of the millstones' raw materials proves to be more difficult than previously assumed, especially regarding the Central/Western Mediterranean and the Aegean region.

Based on own provenance analyses of millstones from the Mediterranean region, the presentation reviews previously suggested provenance determination approaches in the light of new geochemical data and aims to show their limits, but also their potential, alongside with alternative discrimination strategies. It promotes to link typological and functional studies to provenance determinations, to track possible routes along which innovations travelled.

02 HOPPER-RUBBER MILLS IN THE EASTERN MEDITERRANEAN AND ITS HISTORICAL IMPLICATIONS

Author(s): Hasegawa, Shuichi (Rikkyo University)

Presentation Format: Oral

This paper aims to illustrate the diffusion of hopper-rubber mills in the eastern Mediterranean and diverse effects which they may have brought to the society. The diffusion of this type of mill definitely alleviated the burden of domestic milling, possibly caused a 'revolution' in milling activity, eventually changing the concept of milling altogether. The use of hopper-rubber mills instead of saddle querns gave people more time for other activities. It may also have brought about change both in the gender division of labour and in specialisation of occupation. Previously milling had been allocated mostly to women. Egyptian art and biblical literature depict women and youths milling using saddle querns. The rapid diffusion of hopper-rubber mills shows their considerable effect on society, especially in the southern Levant where this 'new gadget' was first brought in from abroad. It was not long before they began to produce their own 'machines' as is shown by a regional distribution map and provenance analysis. Being a major commodity of maritime trade as demonstrated by discoveries in shipwrecks, hopper-rubber mills may have played a significant role in the history of the eastern Mediterranean until the appearance and diffusion of rotary querns which most likely caused the emergence of the professional bakery.

03 THE HISTORY OF MILLSTONES IN IRON AGE ISRAEL AND SOME TECHNICAL, FUNCTIONAL, SOCIAL AND CULTURAL ASPECTS

Author(s): Eitam, David (Independent researcher)

Presentation Format: Oral

The long history of grinding tools in the Southern Levant came to a peak in Israel during the Iron Age, a period that saw a variety of types and the introduction at its end of the "rod mill". The earliest grinding device, as rock-cut installation, in the area dates to the

Natufian period (c. 13,500 cal BP). Their manufacture subsequently developed throughout thousands of years ending in mass-produced 'industrial' approach in the Iron Age that saved both time and effort and resulted in efficient, lower-energy tools. Different types of basalt served for each part of the mill. Domestic, small, loaf-shaped grinding slabs were used in houses, whereas mass-produced types were common to 'public' structures. Settlements far from the source of basalt, or those that could not afford to import basalt, use inferior raw materials, which led to an alteration of millstone shapes (shapes were thus the outcome of both technical and cultural causes). The question of the number and location of millstones in a household context is also the object of study by analysing the spatial distributions of seven groups of stone tools in conjunction with spatial distribution analyses. Millstones are classified in the categories of 'food preparing devices' along with mortars, massive bowls, pestles and pounders (other categories are 'handicraft devices', 'trade items', 'personal belongings', 'art and ritual objects', 'industrial tools' and 'serving wear'). The spatial distribution of these seven categories covers the range of domestic activities, while the ratio among them can throw light on socio-economic aspects. The comparison of the distribution of the groups with the spatial distribution of millstones help define their role in the framework of other food implements and the location of flour making in the Iron Age 'kitchen'.

04 PROVENANCE AND FUNCTION OF MILLSTONES IN THORIKOS, ATTICA

Author(s): Duchene, Sophie (Ghent University)

Presentation Format: Oral

A recent intensive survey of the site of Thorikos, carried out between 2012 and 2015 by the universities of Ghent and Utrecht, yielded more than 130 millstones and millstone fragments. These add to the ones already found during excavations since the sixties but not yet studied. Preliminary study of these finds shows that most of them are made of non-local volcanic rock, suggesting the participation of Thorikos in regional or supra-regional exchange networks for the supply of these implements.

Next to the imported nature of most of the finds, another particularity is that some were used in the silver production process to grind the ore so that it could be purified and concentrated before being melted. Based on ancient sources and on the find of Olynthus mills in ore-processing workshops in the Laurion, those mills are considered by modern scholars to be the best candidates. However, other types of milling implement could have been used too and it cannot be excluded that in Thorikos Olynthus mills were also used to grind grain.

A combined and diachronic study of the use and the provenance of the finds would bring more insight into the economic and technological choices made in Thorikos and into the exchange networks that were used for the supply of, at one hand, the milling implements needed for domestic purpose and, at the other, for the ones that were needed for metallurgical purpose.

The finds will be documented thanks to a macroscopic study and 3D-modelling (Agisoft PhotoScan). Petrographic and geochemical analysis will help to characterize the raw material and to determine the provenance of the artefacts. To distinguish between domestic and metallurgical use, macro- and microscopic observations will be carried on and a pXRF device will be used.

05 TECHNICAL INNOVATION IN MILLING TECHNOLOGY IN MEGARA HYBLAEA (SICILY)

Author(s): Chaigneau, Chloé (Université Paris 1 Panthéon-Sorbonne / UMR 7041 - ArScAn)

Presentation Format: Oral

During the first millennium BC, Sicily emerged as a cultural crossroads, thanks to trade routes and multicultural inhabitants (indigenous sites, Punic settlements, Greek "colonies," later Roman control). These multiple influences offered a great opportunity for interaction (or not) between different cultures, often taken to be an important factor of innovation.

We report on a large collection of millstones from Megara Hyblaea, one of the first Greek establishments in Sicily. The site was almost always inhabited from its foundation in 728 BC up to a small Roman settlement in the 4th AD, although it went through various stages of prosperity or crisis. The millstones range from the simplest saddle-querns and hopper-rubber mills to several types of rotary mills ("Morgantinian," composite "Delian" mills, and hand-mills).

Due to the lack of archaeological context, an important part of the study consisted in clarifying the comparative chronology for the uses of these mill types. This focus led to considerations about what factors determine the choice and use of a given mill, reflecting social, economic and cultural specificities.

Two processes appear from the analysis of the collection: on the one hand, the progressive standardization of the traditional mill types; on the other hand, the emergence of bigger, novel mill types, increasing the output. Our purpose is then to reach a more precise understanding of the stages of these phenomena, considering how the specific case of innovation in milling technology bears on a more general discussion about technical innovation.

06 THE QUERNS OF THE GREEK COLONY OF OLBIA AT HYÈRE (VAR, FRANCE)

Author(s): Jaccottey, Luc (Inrap Grand Est Sud; UMR 3249 laboratoire chronoenvironnement) - Cousseran-Néré, Sylvie (Inrap Auvergne Rhône-Alpes; UMR 8215, Trajectoires)

Presentation Format: Oral

Olbia (Hyère, Var, France) was a colony of Massalia (Marseille, Bouches-du-Rhône, France) founded around 325 BC which later fell under Roman control when Marseille was captured by the troops of J. Caesar. The excavations carried out by J. Coupry (1947-1971) and M. Bats (1982-1989 and 2002-2013) brought to light an assemblage of nearly 150 querns often in the form of fragments. Half

the saddle querns and hopper rubbers (Olynthus mills), and about 20 rotary querns, were unearthed in the more recent stratified and well-dated excavations of Sector VI. Unfortunately, the same cannot be said of those collected during the earlier excavations by J. Coupry.

The analysis of the assemblage has yielded a typology of hopper rubbers, an Iron Age mill that is characteristic of Greek influence in Mediterranean Gaul. With exception of finds from the sites of Lattes (Hérault, France) and Martigues (Bouches-du-Rhône, France), this is a mill type that has seen little research in the Western Mediterranean. The study also advances understanding of the transition between hopper rubbers and rotary querns in this region. The study of the Olbia collection therefore marks a step forward in the knowledge of the innovations linked to milling in the south of France.

07 QUERNS AND ROTARY QUERNS IN THE TRADING CENTRE OF LA FONT DE LA CANYA, BARCELONA, CATALONIA, SPAIN (7TH-3RD CENTURIES BC)

Author(s): Alonso, Natàlia (University of Lleida) - Sablev, Kamen (ArqueoVitis SCCL) - Jaccottey, Luc (Inrap Grand Est Sud; UMR 6249, CNRS) - López, Daniel (ArqueoVitis SCCL)

Presentation Format: Oral

The site of Turó de la Font de la Canya (Barcelona, Catalonia, Spain) was certainly an important centre for cereal storage serving as a trading post with other cultures of the Mediterranean as suggested by the combination of numerous underground silos and Phoenician and Greek imports. The site is set on a small promontory about 15 km from the present-day coastline and about 40 km to the south-west of Barcelona. Its occupation spanned the 7th to the 2nd century BC, that is, from the spread of iron working technology to the Roman conquest.

The site comprises an assemblage of two hundred millstones that can be broken down into 183 saddle querns and 21 rotary querns. The latter appeared from the 4th century BC. It was not possible to study the spread of these grinding tools throughout the settlement as most were uncovered in silos. Yet their general spread probably points to the existence of production areas. The typological study of the millstones, as well as the choice of the rocks chosen for their manufacture (granite, sandstone, conglomerate, basalt and limestone) serve as evidence of their evolution in the framework of a commercial enclave linked for 400 years to the Mediterranean world. Yet in spite of the contacts with the East, there is little influence of the colonial world on the types of grinding tools, a fundamental aspect of the town's economy. This is evidenced when comparing the site's many features of wine production and consumption, clearly reflecting a colonial influence, that contrast with the durability of the Iberian milling tool tradition that remains impervious to external influences.

08 SADDLE QUERNS FROM THE 5TH CENTURY BC IN SOUTH-EAST IBERIA

Author(s): Vives-Ferrandiz, Jaime (SIP-Museu de Prehistòria de València) - Pérez Jordà, Guillem (Instituto de Historia, CCHS-CSIC) - Ferrer García, Carlos - Tortajada Comeche, Guillermo (SIP-Museu de Prehistòria de València)

Presentation Format: Oral

Toward the middle of the first millennium BC, rotary querns were adopted by Iberian communities and over the following centuries disseminated widely in eastern Iberia. The incorporation of this novelty went hand in hand with other major changes in the sphere of social relations and farming that affected the scale of production and transformation of produce. In south-east Iberia, saddle querns were not completely abandoned although their identification in the archaeological record is elusive up to date.

In this paper, we will present fresh evidence from south-east Iberia for the use of saddle querns in a context dated to the 5th century BC. The site of La Cervera (La Font de la Figuera, Valencia) has yielded a number of saddle querns in middens and deposits, mainly associated to metallurgical workshops. Two types of stone sources can be detected in the saddle querns. There are also rotary querns, which imply the coexistence of two types of querns, probably from the same quarries. How can we interpret this pattern? Although the date of the settlement roughly corresponds to the substitution of saddle querns for rotary querns, we will argue that the former might have been used in the sphere of metallurgical workshops.

09 CHANGES IN MILLING TECHNOLOGY IN CENTRAL EUROPE FROM FIFTH TO FIRST MILLENNIUM BC: TRANSPORTATION COSTS AS A DRIVING FORCE

Author(s): Gundelach, Marthe (University of Cologne)

Presentation Format: Oral

Technological innovations are life-determining in various ways. On the one hand, new technologies may reduce the workload in a production process; on the other hand, they may lead to an irreversible loss of knowledge and skills. This irreversibility leads to economic dependencies that cause changes in social structure.

In my paper I will discuss the circumstances of innovation in milling technology of Central Europe. Here, as in the Mediterranean, grain was processed exclusively with saddle-querns during the Neolithic and Bronze Age. Already at this time, an innovative selection of raw material and an increase in the size of work surface can be observed. In the 5.-3. century BC rotary-querns occur for the first time north of the Alps. An extensive use can only be ascertained from the 2.-1. century BC, during the late Latène period, when millstones continue to exist in parallel. The mechanisms that prompted the establishment of rotary querns in Central Europe are still unclear. Investigations using diffusionistic approaches or comparisons with wealth indicators could not explain the spread of the new tech-

nology so far. One way of understanding the innovation process of milling technology is to look at the mills production process. Processing marks on saddle- and rotary-querns can be used to develop operational sequences of production. For individual components of the process, costs can be calculated as workload by means of historical, ethnographical and experimental analogues which in particular show a decline in transport costs. Among the societal, economic and social conditions that underpin the innovation of milling technology, declining transport costs can be identified as a driving force behind the diffusion and establishment of innovation.

10 MILLSTONE PRODUCTION IN THE QUARRY AT FONTE DA RIBEIRA IN THE TERRITORIUM METALLORUM TRESMINAS / JALES (DISTR. VILA REAL, P)

Author(s): Wahl-Clerici, Regula (Universität Frankfurt am Main)

Presentation Format: Oral

In the Roman mining district territorium metallorum Tresminas / Jales in the district of Vila Real in Northern Portugal a polymetallic deposit with high contents of gold was exploited in Antiquity. The nowadays preserved monuments include not only zones where the precious metal was actually extracted during the 1st and 2nd century but also remnants of ore-processing and of a settlement. But further functional areas were most important for the provision of this industrial complex with goods. Of special interest are the Roman quarries where two-mica or biotite granite has been mined. The second type was processed to mills for ore-processing purposes or to stamp mills, of which over 1000 are conserved in Tresminas. Millstone for cereal treatment were produced among other objects from the two-mica granite in the 7 ha quarry of Fonte da Ribeira. A rich variety of discarded products left behind allows the reconstruction of the production process starting with the selection and splitting of a granite block till the modelling as bed stone or runner stone. Due to these it was possible for the first time to follow up the systematic approach of the Roman stonemasons for the production of millstones made of granite in every detail.

11 GRINDING AT HOME. TRADITIONS AND CHANGES IN THE WESTERN CATABRIAN AREA

Author(s): Ruano Posada, Lucía (Universidad Autónoma de Madrid)

Presentation Format: Oral

The use of millstones in domestic environments is an underrated aspect of Iron Age fortified settlement (*/castro/*) research in the North of the Iberian Peninsula. Although querns are abundant in the archaeological record, they are only rarely described or illustrated in monographs and papers, a fact that complicates assessment of the development of regional grinding systems. Furthermore, archaeological research has most often neglected this area of the Iberian North-West, obscuring the possibility of identifying regional patterns. This study therefore re-examines the different types of mills put to use throughout the first millennium BC in the Western Cantabrian area, from the traditional quern driven with a to-and-fro motion to the introduction of the rotary quern. The aim is to understand the development of grinding techniques, as well as comprehend how and why these new models were introduced and what socioeconomic consequences this may have had for the communities in this region. Moreover, although querns most often are unearthed in secondary contexts, this study analyses several examples of mills brought to light in their primary context. Data from these */in situ/* mills enables us not only to distinguish different households but also to determine the types of daily activity that were carried out in these domestic units.

a. A UNIFIED DATABASE FOR HOPPER-RUBBER MILLS

Author(s): Chaigneau, Chloé (Université Paris 1 Panthéon-Sorbonne / UMR 7041 - ArScAn) - Cousseran-Néré, Sylvie (Inrap ARA, Centre archéologique de Valence - UMR 8215 Trajectoires) - Jaccottey, Luc (Inrap Bourgogne Franche-Comté, UMR 6249, laboratoire chrono-environnement, Besançon) - Nodin, Sabine (-)

Presentation Format: Poster

The hopper-rubber mill is commonly considered a marker of Greek civilization : it originated in the eastern Mediterranean and was diffused westward by Greek settlers. It can be described as a greatly improved saddle-quern, the two main innovations being the hopper (as included in its name) and a system of mechanization. Regarding mechanization, two reconstructions are currently accepted: in southern France, a back and forth motion induced by a kind of wooden frame is attested, while the arc-motion induced by a single pivot and a handle is generally accepted for the eastern Mediterranean. This divergence is one of the many variations within the type. In 2003, R. Frankel presented the elements of a solid typology (shape of hopper and upper stone, method of attachment of the handle, striation patterns) but essentially focused on the eastern Mediterranean. In the present work, we developed a data-collection standard to extend this typology to describe hopper-rubber mills of the entire area.

This standard is based on the two databases of the French Groupe Meule – one for querns, the other for rotary mills. The terminology is precisely defined and drawing standards are given to represent the device efficiently.

Our goal is to provide a tool to collect data on hopper-rubber mills. This is the first step to the development of the typology, the analysis of the stages of its appearance and diffusion, and a better understanding of its utilization. Additionally, using unified methods to describe and analyze every type of mills – querns, hopper-rubber, rotary mills – can help us to understand the transition from one to another type.

b. A GREEK TYPE OF UPPER STONE QUERN AT CORNEILHAN (HÉRAULT, FRANCE)

Author(s): Jaccottet, Luc (Inrap Grand Est Sud; UMR 6249, laboratoire chronoenvironnement) - Gluhak, Tatjana M. (Römisch-Germanisches Zentralmuseum Mainz) - Ranche, Christophe (Inrap Méditerranée; UMR TRACES, 5608 RHAdAMANTE)

Presentation Format: Poster

The excavation of a small site à Corneilhan (Hérault, France), probably a settlement, brought to light three pits of which two are interpreted as silos. This site dates to the middle of the 5th century BC. Finds include Attic pottery, a type of artefact that although not uncommon during this time frame to urban settlements (oppida), is rare in rural areas. Although no domestic unit was uncovered, the two silos and the pit (which ultimately served as a rubbish tip enclosing unusual artefacts), suggest the proximity of a settlement.

The upper stone of the saddle quern (missing one of its extremities) was found lying flat at the bottom of one of the silos. It is leaf-shaped with a trapezoidal section (length: less than 50 cm, width: 23 cm). Its form recalls the “eye-shaped quern” or “boat-shaped quern” models known in the archaic Greek world in the 6th century BC stretching from Greece, through Sicily (Selinunte) and to the Balearic Islands (Cala San Vicenç) and Catalonia (Puig de Sant Andreu - Ullastret).

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CURRENT APPROACHES TO TELLS AND TELL-LIKE SITES IN THE PREHISTORIC OLD WORLD

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Blanco-González, Antonio (Grupo PREHUSAL, Universidad de Salamanca) - Kienlin, Tobias L. (Institut fuer Ur- und Fruehgeschichte, Universitaet zu Koeln)

Format: Regular session

Within household archaeology two big contrasting patterns occurred at assorted times and regions, sometimes in tandem: a) the horizontal displacement of short-lived habitats leading to flat sites; and b) the vertical replacement of superimposed occupations resulting in deep (often long-lasting) biographies; i.e. highly-redundant and highly-congruent sites. However, such dynamics have been hitherto tackled from isolated local perspectives or discussed in culture-specific academic debates. This session will focus on multi-layer sites in Eurasia from the Earliest Neolithic up to the Iron Age, and from Western Europe to the Middle East, envisaged as a transversal phenomenon whose commonalities and divergences are poorly understood yet may benefit from cross-cultural comparison.

Contributors are encouraged to present synthetic overviews or cases studies in social terms from theoretically-informed and methodologically innovative perspectives on this cultural phenomenon. Papers should address key questions such as: what social practices (e.g. dwelling, gathering, maintenance or abandonment chores) contributed to their characteristic formation in contrast to those held on flat sites?; what are these deeply-stratified sites made of (e.g. everyday refuse or middens, sun-dried mud, daub or stone building debris)?; how can we measure and correlate time with sedimentation rates/accumulation trajectories using ‘micro-archaeological’ science-based methods (micromorphology, taphonomy)?; how did these sites relate to mobility/sedentarism and high/low-density aggregation dynamics?; how cutting-edge excavation and survey datasets may support sounder social interpretations?; what cultural rationales, sensory experiences or arenas for social negotiation may have fostered/afforded such archaeology (in terms of genealogies, history making and cultural memory, monumentalization, movement and perception, legitimation of ownership claims)?

ABSTRACTS

01 THE MESSINESS OF EVERYDAY LIFE. REFLECTIONS ON SITE FORMATION PROCESSES AT THE BRONZE AGE TELL OF SZÁZHALOMBATTA-FÖLDVÁR, HUNGARY

Author(s): Sofaer, Joanna (University of Southampton) - Sørensen, Marie Louise (University of Cambridge; University of Leiden) - Vicze, Magdolna (Matrica Museum, Százhalombatta)

Presentation Format: Oral

Accounts of Bronze Age tells tend to suggest that they are neat accumulations composed of ‘sandwiches’ of floors, burnt wall rubble, leveling fills, and then the next floor. These narratives lend themselves to clear chronological accounts and fuel a notion of life on the tell being cyclical, locked in the rhythm of house biographies. The Százhalombatta tell excavation is beginning to challenge this view. Firstly, it shows how our view of tells underestimates the messiness of everyday life, the complexity of human practice and the vagaries of decision making – even when performed within the most normative stages in the site’s history. Such actions are evident, for example, in the ceramics deposited and redeposited in areas of the tell. Secondly, the excavation is also revealing that at some stages the rhythm appears totally broken due to various kind of spatial reorganization. One example of this was when a road was made to run over the site, which altered pre-existing uses of the areas affected. Even more radically, as we are now coming down to the beginning of the Koszider phase the houses have ‘disappeared’ and in their place we have a very ‘unruly’ messy phase with considerable deliberate movement of soils and materials including heaps of plant ash and a larger amount of articulated bones than seen in the later levels. In this paper we reflect on these changes and their implications for social practice in terms of the ‘dynamic maintenance’ of the tell by its inhabitants.

02 MULTI-LAYERED SETTLEMENT IN KAKUCS-TURJÁN MÖGÖTT: A BOTTOM-UP APPROACH TO MIDDLE BRONZE AGE SETTLEMENTS IN HUNGARY

Author(s): Staniuk, Robert (Graduate School "Human Development in Landscapes") - Jaeger, Mateusz (Uniwersytet im. Adama Mickiewicza w Poznaniu) - Kulcsár, Gabriella (Magyar Tudományos Akadémia) - Taylor, Nicole (Christian-Albrechts-Universität zu Kiel; Johanna-Mestorf-Academy; Graduate School "Human Development in Landscapes") - Niebieszczański, Jakub (Uniwersytet im. Adama Mickiewicza w Poznaniu) - Pető, Ákos (Szent István University)

Presentation Format: Oral

Settlement practices of the communities inhabiting Central Hungary in the first half of the second millennium BC are generally associated with large-scale social units, identified on the basis of well-recognised ceramic styles. Histories of particular areas, and the practices their inhabitants were involved in, are usually explained by means of attributing human behaviour and actions to particular ceramic styles. This in turn leads to a situation by which the development of communities constructing, inhabiting and maintaining settlements seem to be generated by groups of people, who instead of forming their identities and developing their world-views as a result of a mode of life, were initially connected with super-structures, which preceded and structured their actions. As such, tell-sites in Bronze Age Hungary are well-documented by means of stylistic attribution, but remain mysterious in terms of their individual life-histories.

Having defined the obstacles in studying settlements of the Hungarian Middle Bronze Age, this talk focuses on the results of the on-going Kakucs Archaeological Expedition. The aim is to show how interdisciplinary research, which combines non-invasive and geoarchaeological surveys with detailed stratigraphic excavations, provides evidence of the complex life-history of multi-layered sites in Central Europe. By focusing on the practices involving house construction and space maintenance, this presentation aims at highlighting that instead of interpreting such sites in terms of wide frameworks, the initial necessary step is to recognise their formation and the practices involved in the everyday life of their inhabitants.

03 GEOPHYSICAL AND GEOCHEMICAL SIGNATURES OF THESSALIAN TELL-SITES: CHARACTERISING SITE STRUCTURES AND FUNCTION USING MINIMALLY INVASIVE METHODS

Author(s): Cuenca-Garcia, Carmen (NTNU) - Jrad, Abir (University of Gabès) - Karampatsou, Georgia (Technical University of Crete) - Sarris, Apostolos (Laboratory of Geophysical - Satellite Remote Sensing & Archaeo-environment Foundation for Research & Technology, Hellas - F.O.R.T.H., Institute for Mediterranean Studies - I.M.S.)

Presentation Format: Oral

This presentation will show the results of a study focused on characterising soil samples collected in three tell sites in the region of Thessaly (Greece) using magnetic susceptibility and phosphate analyses (χ and P hereafter). Soil sampling was carried out after several fieldwork campaigns of large scale and multi-technique geophysical survey (Simon et al., 2015). The main aim of the study was to explore the potential of these soil analyses to improve the interpretation of specific features detected during the geophysical surveys and determine possible prehistoric activities at the sites. These particular sites were selected in terms of the quality of the results obtained with the geophysical surveys and the definition of the features to explore further with soil characterisation. A total of 712 soil samples were collected at the three sites. The samples were taken along lines crossing the sites at two depths (A= ploughed soil and B= top of the archaeological horizon). Augured samples were also taken at the location where several ditch-like and thermoremanent structural geophysical anomalies were detected. The presentation will discuss the potential and limits of soil prospection using χ and P analyses to study such sites when combined with geophysical surveys. In particular, the results provided by each type of soil analysis will be compared to assess their ability to characterise the make-up of specific archaeological geophysical anomalies and provide clues relating to past agro-pastoral activities carried out at each site.

04 THE BIRTH OF THE BRONZE AGE TELL AND TELL-LIKE SETTLEMENTS IN THE EASTERN CARPATHIAN BASIN. CASE STUDIES: TOBOLIU AND SÂNTION

Author(s): Gavan, Alexandra - Lie, Marian Adrian (Institut für Ur- und Frühgeschichte Universität zu Köln) - Fazecaş, Gruia (Țării Crișurilor Museum) - Cordoş, Cristina (Iași Institute of Archaeology) - Kienlin, Tobias (Institut für Ur- und Frühgeschichte Universität zu Köln) - Gogâltan, Florin (Institute of Archaeology and Art History Cluj-Napoca)

Presentation Format: Oral

In the case of Bronze Age tell settlements, the process of site formation is a very complex one, involving numerous factors: landscape, type of economic activities conducted within, architecture, demographics, etc. However, our understanding of this process is somehow limited, as many questions remain unanswered.

Within the project Living in the Bronze Age tell settlements. A study of settlement archaeology at the Eastern frontier of the Carpathian Basin, numerous sites located in Western Romania were investigated through various non-invasive methods. The neighbouring sites from Toboliu and Sântion (located only 7 km away from each other) were also chosen to undergo excavations. After several archaeological campaigns, it was obvious that both sites follow the general pattern of Bronze Age tell-site formation (multilayered settlements with several phases of construction and reconstruction of surface dwelling made out of wood and plaster), but each one has also specific characteristics that makes it unique.

With this occasion, we would like to present the results of our investigations which are relevant to the process of site formation for

the two tell-settlements located in a micro-region characterised by specific geo-morphological factors. Obviously, the surrounding landscape has a great role when it comes to the appearance and further evolution of a site. The impact of enclosing elements, such as ditches, was also discussed in relation to the creation of the mound itself. The thick stratigraphic sequence of the tell consists of layers accumulated in various ways: construction phases, destruction phases, layers of soil brought for outside of the inhabited area, debris and garbage. Therefore, the architecture employed by those communities directly influenced the formation of the site. Obviously, all tell-settlements started as flat settlements. However, their further evolution was significantly different from a regular habitation, resulting in an artificial mound visible in the landscape.

05 SUBSISTENCE ACTIVITIES AND SYMBOLIC PRACTICES IN A NEOLITHIC TELL-LIKE SETTLEMENT OF THE GREAT HUNGARIAN PLAIN (ÖCSÖD-KOVÁSHALOM)

Author(s): Füzesi, András - Raczkó, Pál (Eötvös Loránd University Faculty of Humanities)

Presentation Format: Oral

Öcsöd-Kováshalom site represents a settlement with a remarkable spatial organisation in the Late Neolithic settlement network of the Tisza region in Carpathian basin. The archaeological investigation in the 1980s brought to light the remains of a dispersed settlement of the Tisza culture. In the centre of the settlement rose a tell-like mound enclosed by seven smaller clusters of houses. The intensive topographic survey revealed that the settlement reflecting a complex aggregation extended over an area of roughly 3–5 hectares.

The radiocarbon dates indicated that the main settlement mound that once overlooked a watercourse, whose occupation levels accumulated to a height of 130–160 cm, could be dated between 5200 and 4980 BC. The excavated archaeological features on the tell-like mound clearly indicated an area divided into concentric activity zones. The refuse pits around the houses and the burials form an integrated spatial segment, embodying internal territorial environments linked to each other. These zones outline the settings of the local interactions between daily activity types and thus represent taskscape configurations. This essentially involved a reorganisation of the earlier house-pit-yard-grave spatial module, resulting in a new spatial configuration that reflected and embodied the changed population density and social relationships. This internal spatial configuration recurs in the superimposed settlement levels, extending thereby the community's structuring of space into a third dimension. These patterns outline an essentially novel social, economic and ritual dynamism at the onset of the local Late Neolithic, whose general principles of spatial organisation can be rightly regarded as the expression of a new "paradigm". During our investigation of the site, we were able to identify a series of symbolic activities linked to the spatial segments of various domestic activities at Öcsöd-Kováshalom that indicated special activity loci and activity trajectories that in a sense transcended the settings of quotidian activities.

06 POPULATION SIZE, AGRO-PRODUCTION, AND COLLAPSE IN THREE TELL SITES FROM THE CARPATHIAN BASIN

Author(s): Duffy, Paul Regis (University of Toronto) - Czukor, Péter (Móra Ferenc Múzeum)

Presentation Format: Oral

Fortified tell sites and the population aggregations around them are a common settlement type during the Neolithic and Bronze Age in the Carpathian Basin. In many cases, however, they seem to be inhabited only for several generations. Significant population aggregation requires intensification of food production and a reorganization of labour, and scalar stress discourages population nucleation in the absence of local hierarchy. Did limited agricultural production promote dispersal from prehistoric tell sites? To what extent did stress from population concentration underpin their collapse? This paper compares demographic changes at tell sites from two social trajectories from the Neolithic and Bronze Age: the Lower Körös Basin in Eastern Hungary, and the Danube and its tributaries in Central Hungary. Our case studies are Bronze Age Százhalombatta-Földvár on the Danube, and in the Lower Körös Basin, Bronze Age Békés-Várdomb and Neolithic Szeghalom-Kovácsshalom. We use systematically collected survey data to model aggregation and dispersal of populations in each trajectory, and focus on agriculture for a window into settlement history. A settlement's domestic economy is generally sustainable by the local productive catchment, but local food consumption needs can also be met by intensifying production, trade or tribute. Modeling populations, productive catchments, and yearly subsistence needs of settlements, we discuss the constraints on population expansion that people living at these settlements may have experienced.

07 DEEPLY STRATIFIED SITES FROM CENTRAL IBERIA: COLLATING THE MANCHA BRONZE AGE AND THE EARLY IRON AGE DUERO BASIN.

Author(s): Blanco-González, Antonio (Universidad de Salamanca)

Presentation Format: Oral

This contribution deals with household archaeology in Iberia, where multi-layered sites are a rare occurrence, as elsewhere in the Old World. Even modern rural long-lived villages in the region did not lead to such a material outcome. Despite their exceptional character, deeply stratified settlement mounds were relatively abundant in later prehistoric Iberia within social landscapes where they always were minority. Mainstream accounts have it that the thickness and massive nature of such sites have to do with their long biographies and the permanent lifestyles of their occupants. Yet further contemporary flat sites resulted in completely different archaeological correlates. How are we to deal with this variability? The paper adopts a comparative approach to tackle two such

examples from the Spanish Central Plateau: the Bronze Age of La Mancha (2200-1500 BC) and the Early Iron Age of the west-central Duero basin (900-400 BC). In both cases defensive fortification is commonly posited as key to understanding their cumulative and massive settlement archaeology. This cross-cultural assessment offers new insights into further social practices responsible for this kind of archaeology. Ultimately, tell sites fostered highly recurrent and highly congruent habits and probably accrued on-site monumental symbolism in terms of history making, genealogical rootedness and permanence.

08 TELL FROM DATA: LARGE-SAMPLE APPROACHES TO PREHISTORIC SETTLEMENT LAYER BUILDUP IN THE NEAR EAST AND EUROPE

Author(s): Rosenstock, Eva - Schier, Wolfram (Freie Universität Berlin, Institut für Prähistorische Archäologie)

Presentation Format: Oral

"Tell", "tell-like settlement", "stratified settlement" and "flat settlement" do not denote discrete archaeological phenomena, but categories within a continuous range of stratigraphic depths in settlements. As a site trait, stratigraphic depth shows a clear overall gradient between the Near East, Southeastern and Central Europe, suggesting both settlement duration and environmental factors as possible determinants. Here, large site databases not only allow for cross-regional and diachronic mapping, but also for multivariate statistical analysis of covariates such as a site's classification, depth of stratification, area, architecture and occupation span, as well as climate and soil types. Based on a sample of more than 12 000 Neolithic and Copper Age sites from the Near East and Southeastern Europe (Rosenstock 2009), as well as Central Europe (Preuß 1998) up to ca. 3000 BC, the paper outlines trends in archaeological site classification and actual layer buildup along the Danubian trajectory of Neolithization.

J. Preuß, Das Neolithikum in Mitteleuropa. Kulturen – Wirtschaft – Umwelt vom 6. bis 3. Jt. v. Chr. (Weissbach 1998).

E. Rosenstock, Tells in Südwestasien und Südosteuropa. Entstehung, Verbreitung und Definition eines Siedlungsphänomens (= Urgeschichtliche Studien II) (Grunbach 2009).

E. Rosenstock, Environmental Factors in Tell Formation. An Archaeometric Attempt. In: R. Hofmann - F.-K. Moetz - J. Müller (eds), Tells. Environmental and Social Space (= Universitätsforschungen zur Prähistorischen Archäologie 207) (Bonn 2012) 33-45.

W. Schier, Die Tertiäre Neolithisierung – Fakt oder Fiktion? In: J. Lechterbeck - E. Fischer (eds), Kontrapunkte. Festschrift für Manfred Rösch (= UPA 300) (Bonn 2017) 129 – 146.

09 RE-DISCOVERING THE NEOLITHIC LANDSCAPES OF WESTERN THESSALY, CENTRAL GREECE

Author(s): Krahtopolou, Athanasia (Ephorate of Antiquities of Karditsa, Hellenic Ministry of Culture & Sports) - Orengo, Hector (McDonald Institute for Archaeological Research, University of Cambridge) - Frederick, Charles (Department of Geography and the Environment, University of Texas at Austin) - Dimoula, Anastasia - Saridaki, Niki (Department of History & Archaeology, Aristotle University of Thessaloniki) - Garcia, Arnau (McDonald Institute for Archaeological Research, University of Cambridge) - Kyriolidou, Stella (Department of History & Archaeology, Aristotle University of Thessaloniki)

Presentation Format: Oral

Thessaly has been traditionally perceived as the 'cradle' of the Greek Neolithic (7th to 4th millennium BC) and a key area to understand and contextualise the route(s), timing, ways and tempo of the Neolithic beginnings in Europe. From the beginning of the 20th century onwards, archaeological research in Thessaly embodied all major theoretical and methodological developments that influenced prehistoric research in Greece and south-east Europe. At the same time, early research shaped some of the strongest stereotypes that dominate debates on Neolithic settlement and society. These, have been challenged only recently due to rigorous archaeological work, mainly in the north of the country.

Eastern and coastal Thessaly exhibit exceptional density of Neolithic settlements, whereas the striking scarcity of Neolithic presence in the western plain has been usually attributed to unspecified "unwelcoming physiographic characteristics". This picture is changing drastically through a) a new, interdisciplinary landscape project that explores the western Thessalian landscape by combining state of the art Remote Sensing, archaeomorphological and geoarchaeological analysis with extensive and intensive surface survey data; b) fresh excavation evidence from both tell-like and flat extended sites and c) a new reading of old excavation evidence and stratigraphies through an integrated photogrammetric, archaeological, geoarchaeological and radiocarbon-dating approach.

Our cutting-edge approach identified numerous, previously unknown, tell-like and flat-extended sites, as well as tell/flat-extended complexes and revolutionises understanding of Neolithic occupation patterns, settlement dynamics, social use of space, settlement character and settlement formation processes of both tells and flat-extended sites. The emerging evidence shakes well-established notions, environmental and cultural preconceptions and offers new, unique insights into the Neolithic of Thessaly and beyond.

10 FLAT SETTLEMENTS AND TELLS: NEW DATA REGARDING MULTI-COMPONENT SITES OF THE GREAT HUNGARIAN PLAIN FROM BORDOS, SERBIAN VOJVODINA (5200-4500 BCE)

Author(s): Hofmann, Robert (Kiel University, Institute for Pre- and Protohistoric Archaeology; Kiel University, CRC 1266: „Scales of Transformation - Human-Environmental Interaction in Prehistoric and Archaic Societies“) - Medović, Aleksandar (Museum of Vojvodina Novi Sad) - Medović, Ildiko (Novi Sad) - Stanković-Pešterac, Tijana (Museum of Vojvodina Novi Sad) - Dreibrödt, Stefan (Kiel University, Institute for Ecosystem Research; Kiel University, CRC 1266: „Scales of Transformation - Human-Environmental Interaction in Prehis-

toric and Archaic Societies") - Hofmann, Antonia (HTW Berlin. University of Applied Science, School of Design and Culture) - Furholt, Martin (Kiel University, Institute for Pre- and Protohistoric Archaeology)

Presentation Format: Oral

During the late Neolithic, large complex settlements emerged in the eastern part of the Great Hungarian Plain, which consists of different components as settlement mounds, flat settlement parts and in some cases also enclosures. This phenomenon seems to concern particularly the catchment of the Tisza River and its eastern tributaries. So far, we understand such settlements insufficiently, since only in some exceptional cases sufficient data are available regarding the temporal and functional relation of the different parts of these kinds of settlements. Thus, it is in the moment in many cases unclear, if flat settlements represented shorter-lived extensions of longer-living tell sites, synchronous populated areas with lower building density, or if they had even other functions than the tell components.

Such an agglomerated settlement – the site Bordoš near Novi Bečej in the Serbian Vojvodina – with a total size of approximately 50 ha, is matter of a Serbian-German cooperation since 2014. In our paper, we want on the one hand to present results of extensive fieldwork such as geophysical survey, drilling, systematic surface collections, targeted excavations and 14c dating. On the other hand, we would like to discuss the results from Bordoš in the context of the larger spatial scale of the eastern part of the Great Hungarian Plain in order to achieve a better understanding of the societal dynamics behind such complex settlement forms. For this purpose, on the one hand, it is necessary to evaluate a) to what extent the history of the site is conform to the development of other complex sites and b) if the site history is following regional trajectories and supra-regional trends of population agglomeration and dispersal. On the other hand, we need to consider settlement layouts and the intra-site spatial distribution of material culture remains.

11 EXPLORING THE BRONZE AGE TELLS AND TELL-LIKE SETTLEMENTS FROM THE EASTERN CARPATHIAN BASIN. RESULTS OF A RESEARCH PROJECT

Author(s): Gogaltan, Florin (Institute of Archaeology and Art History Cluj-Napoca) - Fazecaş, Gruia (Tării Crişurilor Museum) - Găvan, Alexandra - Lie, Marian Adrian (Institut für Ur- und Frühgeschichte Universität zu Köln) - Cordoş, Cristina (Iaşi Institute of Archaeology)

Presentation Format: Oral

The Bronze Age tells occupy one of the highest positions in the settlement system of the Carpathian Basin. Their development covers a period of approximately 1000 years, between cca. 2500 and 1600/1500 B.C.

Our presentation summarizes the results of a research project financed by the Romanian Ministry of National Education between 2013 and 2016. The initial goal was to recover unpublished materials found in the collections of various museums in western Romania and to collect relevant samples for AMS analysis. We also wanted to conduct a series of non-invasive investigations.

In order to understand the social features of this type of household we conducted field researches in a number of 46 multilayered Bronze Age settlements located in western Romania. Among these were many that did not present the defining features of tell and tell-like settlements. The field researches allowed us to establish their morphological characteristics, their relation to the environment and the existence of so-called "satellite-settlements". The geo-physical investigations indicated the presence of large ditches. In the case of the majority of tells and tell-like settlements their presence was also confirmed by aerial photographs.

Establishing the territory on which tells stretched was a real challenge for our team. We made systematic surface researches, as well as archaeological excavations in two tells located 7 km apart (Sântion and Toboliu).

These researches provided new information concerning social practices in multilayered settlements from the eastern Carpathian Basin. While the non-invasive investigations helped us establish the relations with the environment, the archaeological researches allowed us to reconstruct the way tells appeared. We were also able to establish the fact that tells were not always contemporaneous in a micro-region. Therefore, our researches support the hypothesis that in every micro-region existed divergent development rhythms of the Bronze Age multistratified settlements in the Carpathian Basin.

12 BRONZE AGE TELLS IN THE POLGÁR MICRO-REGION (NORTHEAST-HUNGARY)

Author(s): Dani, Janos (Déri Múzeum) - Márkus, Gábor (Archeodata 1998 Bt.) - Bálint, Marianna (Hajdúsági Múzeum) - Bacskai, István (Pelta Bt.)

Presentation Format: Oral

It is almost 30 years, that the first Bronze Age tell-excavation at the site Polgár-Kiscsőszzhalom was begun by Márta Sz.Máthé. During this period the Late Neolithic central place of Polgár-Csőszzhalom has become one of the most well-published and well-known tell-settlement in Europe thanks to Pál Raczky and his researchgroup. On the other hand, in the past decades only very few information about the Bronze Age tells from the micro-region of Polgár was reported. Fortunately, between 1999-2001 connected to the construction works of the M3 motorway and bypass road of Polgár, 3 MBA cemeteries (Füzesabony culture) were excavated by Gábor Szabó and János Dani. There was an interesting attempt to connect these cemeteries to the known BA tells (Kiscsőszzhalom and Ásotthalom). But in the last 10 years as a result of intensive field surveys of the micro-region new BA tells have become known.

In our presentation first of all we try to fill the above-mentioned research-gap with an overview of the Bronze Age tells in the vicinity of Polgár, furthermore we would like to illustrate this special, 'river-oriented' settlement network of this micro-region in the Upper Tisza region. In order for a better understanding of this tell-focused settlement system we use multi-scalar analysis and mainly

non-invasive methods (magnetometric survey; systematic reconnaissance with metal detector; geodetic survey and aerial photography).

13 TELLS (AND FLAT SITES) AS SOCIAL AGENTS

Author(s): Souvatzi, Stella (Hellenic Open University)

Presentation Format: Oral

This paper argues for a multi-faceted approach to tells as the material expression of certain social relations, as the physical embodiment of time and history, and as fluid and only relatively immobile places. It explores what social practices, cultural understandings and ideological structures might have resulted in the creation and maintenance of tells (and of flat sites), using data from Neolithic Greece (7th–4th millennium BC). Special attention is directed to variability and mobility, modes of social cohesion and history-making, and the role of kinship, a subject surprisingly neglected in archaeology.

The distinction of settlement types from Western Europe to the Middle East into tells and non-tells or flat sites has been the subject of a long discussion. However, the traditional overemphasis on the contrasts between tells and non-tells impedes the recognition of variation within either type of site as well as of similarities between the two types of site. Tells themselves are not unitary constructions. There can be considerable differences in their form, size, location, visibility, continuity and internal organisation, as well as considerable changes over time. We therefore need to look deeper into how social groups defined themselves and how they might have been connected with each other and with larger socio-economic groupings. It is also essential to consider the interplay of multiple scales of space and time. The organisation of space and society, at any type of site, always is a complex phenomenon indicating different structuring principles at different scales, e.g. household, settlement, wider physical and social landscape and inter-site connections. A multi-scalar approach can be key to an understanding of tell as an important unit in social structuring and the reasons of its continuing significance. It can also provide a unifying framework for the various bodies of local archaeological perspectives and for cross-cultural comparison.

a. FROM FLOORS TO MIDDENS AND BACK AGAIN - LIFE ON THE BRONZE AGE TELL BORSODIVÁNKA-NAGYHALOM (HUNGARY)

Author(s): Röpke, Astrid - Zerl, Tanja - Nolde, Nadine (Ur- und Frühgeschichte, Universität zu Köln) - Pusztainé Fischl, Klára (Miskolci Egyetem) - Kienlin, Tobias (Ur- und Frühgeschichte, Universität zu Köln)

Presentation Format: Poster

In the Borsod plaine between the Tisza river and the Bükk mountains many Bronze Age tells have been documented. They are located in and close to swampy areas of the floodplain as well as in the foothill region of the Bükk mountains. In this investigation we focus on the Bronze Age Tell in Borsodivánka which is surrounded by wetlands. Micromorphology, geochemistry, archaeobotany, archaeozoology and archaeology were combined to study site formation processes and cultural activities. This integrated approach possibly allows to detect spatial and temporal changes of settlement activity and reveal palaeoenvironmental information.

The earlier stages of the tell are composed of many formal and informal floors. The constructed formal floors consist of lime, whereas in the informal floors different recycled material is included. After the deposition of a collapsed burnt house, informal floors dominate. Subsequently, the most recognisable deposits of the tell were accumulated: Layers of middens consisting of fish- and mammal bones, molluscs, excrements, macro remains, charcoal and burnt material were repeatedly covered by Poaceae mainly Phragmites (reed). This change from dwelling to a dumping area gives rise to a series of speculations from abandonment, to heightening or leveling. So far excavations have taken place on one part of the tell only, further research must be done to give a clearer estimation of the extent of this deposit. However, the repeated use of plant cover evidenced by numerous phytolith layers imply that people were living close and did not want to keep it open. After this episode floor sequences are present again. Interestingly, from then on reed was used in the houses for matting.

431 ELITE CULTURE IN MEDIEVAL AND POST-MEDIEVAL ARCHAEOLOGY

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Atzbach, Rainer (Aarhus University) - Biermann, Felix (University of Greifswald)

Format: Regular session

This session seeks to explore new ways to identify elites in the archaeological source material during the 12th until the 18th centuries. Elite is understood as a group of persons belonging to the upper echelons of society in a town, territory or dominion in terms of military, economic, religious or political power, and even education. This group of peers is characterised by being involved in decision-making processes in their homestead. Moreover, its network includes contacts to similar groups in other areas. The contributions in this session are invited to focus upon archaeological approaches available to identify remains of this powerful group. Therefore, presentations should discuss diachronic or supra-regional features and not just single contexts such as graves, monuments, latrines, or outstanding precious finds. Critical reviews of traditional approaches based upon import, prestigious goods, written sources etc., or new perspectives on these classic elite markers are

welcome.

The session intends to discuss the following questions:

Theoretical background - what characterises elite? Staging and distinction – is elite defined by other societal classes and/or its members? How far is it possible to spot elite while tracing innovative or traditional products? In terms of norms and practice: is it possible to identify rule setters and rule breakers in archaeological source material? Do the upper layer of society and the elite group always coincide? Supply and demand: what is the relationship between procurement of exotic/import/vintage goods and elites? Between conspicuous consumption and understatement – what does elite show off?

ABSTRACTS

01 INTRODUCTION: ELITE CULTURE IN ARCHAEOLOGY - CONCEPTS AND CONTEXTS

Author(s): Atzbach, Rainer (School for Culture and Society, Aarhus University)

Presentation Format: Oral

This paper seeks to explore the theoretical background of current elite discussion in medieval and renaissance archaeology. Traditionally, elite has been defined on the basis of archaeological evidence or written sources. Early medieval “Adelsgräber” (Frauke Stein) or burial rites of ecclesiastic office holders as bishops or abbots and last but not least royal burial sites has been regarded as clear remains of medieval elite. In the post-medieval period the renaissance of grave goods at least in the upper classes of society has opened for a wider time frame. Nevertheless, the period between 1000 und 1500 has not been in the focus of that discussion before. There is remarkable lack of the recognition between history and archaeology in terms of their concepts concerning elite. The first is working with a clear defined legal concept, the latter with a more or less synthetical bundle of features making elite just on the basis of selected finding types or manor houses.

A subproblem is the definition of nobility, burghers and “upper classes” in towns or within the framework of court culture.

The goal of this contribution is to open a discussion with research leading questions:

What defines elite? Who defines elite? What is the difference between its perception by the main disciplines involved in historical archaeology?

02 SOCIAL IDENTITY AND CONSUMPTION FROM URBAN MEDIEVAL AND POST-MEDIEVAL DENMARK

Author(s): Haase, Kirstine (Centre for Urban Network Evolutions; Aarhus University; Odense City Museums) - Whatley, Stuart (Museum of Copenhagen)

Presentation Format: Oral

In 1492 a man named Mattes Goldsmith sold his house located in the very centre of the Danish town Odense to a man called Master Bartholomew Doctor. As the names of these men indicate - and the location of the house suggest - the area was inhabited by the upper layers of society in medieval Odense. In 2013-14 the area was excavated. Another large excavation took place from 2010 to 2014 at the medieval harbour of Copenhagen. In the 15th century Copenhagen became the capital of Denmark and the home of the Royal court. The harbour area, Gammel Strand, was located just across from the Royal Castle and from the 1400s it was recorded as being an area inhabited by merchants, mayors and other members of the Copenhagen elite.

Together these two excavations present a vast amount of well-preserved artefacts and structures that can shed light on the life styles and social strategies of the people who inhabited these central areas in the medieval and early modern period.

Based on the artefacts from the excavations in Odense and Copenhagen this paper presents a diachronic study that aims to demonstrate how social identities were negotiated by applying a consumer strategy model that allows all classes of artefacts and their archaeological and cultural context to be taken into consideration – not just the outstanding and precious, single finds. By doing so the intention is to investigate how different consumption strategies were at play in the medieval an early modern towns and how the changing networks, the urban culture and character of the towns influenced this development. We specifically wish to address the question: Is it possible to identify specific social communities such as the elite in the archaeological record?

03 PROBI HOMINES: IDENTITIES, BODIES AND THE MATERIAL WORLD OF MEDIEVAL MERCHANTS

Author(s): King, Chris (University of Nottingham)

Presentation Format: Oral

The largest English medieval towns and cities were dominated by wealthy merchants who typically controlled the upper ranks of civic government; whether or not they should be considered a distinct class in medieval society, they formed a highly integrated economic and political elite. This paper will seek to explore aspects of the distinctive political and social identity of the medieval merchant class as defined and expressed though space, buildings and material culture. The organisation of mercantile domestic spaces and the expression of wealth and status through portable material culture was extended into the wider urban landscape through practices of civic and religious patronage and display, through which means medieval merchant families sought to constitute themselves as rulers of urban society in the earthly city below as well as the heavenly city above. Merchant families acted as

patrons across a range of cultural and material spheres, drawing on distinctive practices of personal and dynastic 'self-fashioning'. However, we must contextualise what the notion of 'self' might mean in a medieval context. Archaeological conceptualisations of the fluidity of identity categories formed through relationships and entanglements with the material world find their counterparts in medieval conceptualisations of bodies and personhood made up of a shifting balance of elemental properties within humoral theory. A growing interest in the cultural construction and lived experience of medieval bodily practices provides a new lens through which to interpret the distinctive spatial and material habitus of medieval merchants, and the ways in which these embodied practices in turn underpinned medieval notions of personal, social and gender identities within the urban elite.

04 ON THE INTERPRETATION OF ARCHAEOLOGICAL FINDS FROM THE EQUIPMENT OF ARISTOCRATIC HOUSEHOLDS IN EARLY MODERN PRAGUE

Author(s): Blazkova, Gabriela (Institute of Archaeology of the Czech Academy of Sciences, Prague)

Presentation Format: Oral

Social changes in the course of the 15th and 16th centuries increased the purchase power particularly of lower social classes. Consequently, more goods appeared in the households and the equipment of urban classes became similar to that of higher society. Simultaneously, distances between producer and consumer grew, which is witnessed by items not only from neighbouring countries, but even from other continents.

In the Early Modern Ages, the unification of the pottery and glass production and its availability blurred the differences in the equipment of urban households. The social status therefore mainly depends on the dwelling quality, which is determined by the size and facilities (heating, water supply) of the house, its location and household goods that usually appear in last wills. One or two – in our view luxurious – items or imported goods cannot be automatically associated with a higher social milieu. Since archaeological find assemblages contain only a portion of the original items of daily usage in the early modern households, we can only hardly draw an accurate image of the past appearance of a feature, household or area from the perspective of our present view of society based merely on archaeological finds.

Particular examples of find assemblages from Prague-Hradčany are presented to answer the following questions. To which extent are the finds of material culture a relevant source to determine the social status of their owner? What are the risks of using the limited informative value of archaeological finds for the interpretation of a certain finding?

05 SHAPED BY THE ELITES OR THE COMMUNAL WILL? THE FORMATION OF SOUTHWESTERN BALTIC-TOWNS AS AN EXPRESSION OF POWER STRUCTURE NEGOTIATION

Author(s): Radohs, Luisa (Aarhus University)

Presentation Format: Oral

This paper examines elites' impact on the genesis of towns in the southwestern Baltic in the 12th and 13th centuries. The session offers the opportunity to discuss the driving forces behind the early urban development stages and their tangible reflections in the archaeological record. Who formed the town and who was the decisive factor shaping the urban character? The 12th and especially the 13th century set the scene for a novel form of societal organisation – the urban commune. Did this collective union as a whole leave its mark on the townscape? Alternatively, was the urban layout the result of an elite process, determined by the lord of the town and his followers or by particular urban elites like the councillors and prosperous merchants?

To approach the question of elite impact, archaeological features and standing building structures from the early urban phases in connection with their spatial setting will be analysed to understand the developing topography of power within the towns. The form and placement of outstanding architecture and structures will help to characterise urban leading persons and groups along with their status and self-staging in town.

As case studies, the North German Hanseatic town Stralsund and the Danish town Næstved will be analysed enabling a comparative view on the impact of elites for the urban development within the southwestern Baltic.

06 THE POPES, THE COUNTS AND THE MEDIEVAL URBAN BOOM IN TUSCULUM (LAZIO, ITALY)

Author(s): Diarte-Blasco, Pilar (Universidad de Alcalá) - Beolchini, Valeria (Escuela Española de Historia y Arqueología de Roma CSIC)

Presentation Format: Oral

The "Tusculum" Research Project is dedicated to the rediscovery and study of the medieval phase of this important former ancient urban settlement situated 30 km south-east of Rome. Historically, the city played a leading role the history of central Italy, in particular during the Republican era and Middle Ages (10th to 12th centuries). Indeed, for the medieval period, Tusculum might be deemed a rival to Rome because of its political and economic role, with control of the major institutions in Rome, both lay and religious (including the Papacy during the first half of the 11th century), as well as control of the access routes to Rome from the south by both land (Via Latina and Via Labicana) and sea (the ports of Nettuno, Astura and Circeo). The elite in this city is evident thanks to the grand and highly symbolic buildings and structures associated with the lineage (the so-called palace, the churches and the powerful walls of the city); but also thanks to the social differentiation attested in the necropoleis and, in addition, to the exceptional findings, such as import pottery from Sicily and North Africa (11-12th), an important number of coins - which are showing an intense trade -, and a well-preserved lead seal of Pope Alessandro III (1159-81).

By integrating the results obtained using the archaeological excavations and analysis of contemporary literary sources, we have the opportunity to investigate the development of medieval Tusculum until its destruction in 1191. Combining archaeological, archaeobiological, numismatic and historical data, this paper questions the main traits of the elite in this period in central Italy and, most important, how the archaeologist identified those in the archaeological record.

07 CLOTHING THE ELITE: EXPLORING PRIESTLY AND OTHER ELITE BURIALS IN 14TH-18TH-CENTURY FINLAND

Author(s): Lipkin, Sanna (University of Oulu) - Ruhl, Erika (SUNY at Buffalo) - Väre, Tiina (University of Oulu)

Presentation Format: Oral

Clothing is an important tool in the manifestation and representation of social status. It is a conspicuous consumption good that visually divides the poor from the rich. Clothing manufacture represents a significant time investment, and as such only the rich could afford to acquire elaborate items, or foreign trading goods as new products. Simultaneously, because of their production effort, clothes were often used and reused. This paper explores elite burials, their clothing and personal accessories, from seven different sites in Finland dating between the late 14th and 18th centuries (including ca. 140 burials with textile or accessory remains). This paper specifically addresses those burials found beneath rural church floors, a place where the higher rank community members were buried during this period. In addition to location, this paper also considers funerary attire in non-elite and pauper churchyard burials to better synthesize the intra-societal variation between the "elite" and "non-elite" individuals. Analyzing material across a societal spectrum – from both smaller villages and larger towns – provides perspective in evaluating conceptions of the local elite. Additionally, this paper also considers sub-categories of "eliteness," by examining so-called priestly burials – those known to be or interpreted as burials of priests and their family members. In doing so, this paper seeks to break down the often monolithic archaeological categories of status to better examine the inter- and intra-group variation across time and place.

08 TEXTILE BROTHERHOOD SCAPULARS FROM ARCHAEOLOGICAL RESEARCH – FINDS IN ELITES GRAVES

Author(s): Nowak, Marcin (Instytut Archeologii UMK w Toruniu)

Presentation Format: Oral

In the middle of thirteen century appeared scapular devotion. On the way of changes, caused inter alia disintegration in Church during the Reformation, the devotion and the Catholic Church lost part of confessors. During the eighteenth and nineteenth centuries there follows a process of re-entering the devotion.

Basic guidelines were established and confirmed by the Vatican. The Church simply determinate shape, material and way how to make and wear scapulars. According to this law scapulars should be prepared using two rectangular pieces of woolen cloth connected by two pieces of strings or ribbons. This form was derived directly from the monastic apron. The provisions relating to the various scapulars varieties determinate colors or forms of additional elements. All guidelines should be strictly adhered, if someone who owned one would like to get graces and indulgences related to his scapular.

Scapulars finds during the archaeological researches brings us a possibility to determine manufacture techniques and types of used materials in post-medieval and Modern period and also shows indicate differences forms than the Church guidelines. This situation favors to limited understanding of man's relation to the scapular devotion and Catholic religion, mainly in elites. Techniques, materials and way of perform gives additional information how people from richer part of societies modify scapulars on their own way. Why did they brake the main rules and how it's possible that Church hadn't react on this situation?

09 SILK OR LINEN LACE FROM ARCHAEOLOGICAL RESEARCH IN POLAND

Author(s): Grupa, Malgorzata (Nicolaus Copernicus University; Department of Archaeology)

Presentation Format: Oral

From the end of fifteenth century lace belonged to the most attractive ornaments of garments, footwear or headgear. They were also used to decorate walls, beds and all surfaces to which they could be attached. They were produced all over Europe and this was the only area not taken over by handicraft guilds, directed from the beginning of the Middle Ages by men. It would seem that they should belong to quite popular archaeological relics, however they belong to very rare finds on archaeological sites. The most common lace are made of silk or silk with metal braid. Linen lace are unique finds and if they were already discovered, it would only be on remains of naturally mummified human bodies and their clothes. Their presence confirms the suppositions of archaeologists-cosmologies, about their fairly frequent use at the funerals of noblemen and aristocrats. The huge noblemen funerary ceremony was called *pompa funebris*. But did only the richest social groups used them in excess? Who and where had produced lace found in Poland. Whether it was domestic production or they were imported from the main lace production centers from France, Italy, Spain or the Netherlands. These and other questions are waiting for answers.

10 ELITE SOCIETY IN BURIAL TRADITIONS OF RUS' IN THE 15TH-17TH CENTURY

Author(s): Engovatova, Asya - Vasileva, Elena (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Historians and archaeologists define the elite of Russian medieval 15th-17th society as the family members of the royalty and nobility (boyars) along with the upper ranks of the Orthodox clergy. The archaeology evidence indicating burials of this elite class is often difficult to find – particularly because the entire population were Christians, whose conventional burial rituals were mostly ascetic and excluded grave goods. This burial tradition makes it very difficult for archaeologists to determine which graves may have been those of the elite by analysis of the content of the burial. In order to assess the social status of those buried, analysis of bone material has, until recently, been the principle approach. Illustration of these principles is borne out by excavations undertaken by the Institute of Archaeology RAS at two of the most important and powerful monasteries of that era – the former Chudov Monastery then located within the Moscow Kremlin, and the Trinity St Sergius Monastery, in the outskirts of Moscow. Elite burials can be more usually expected at locations of high social status. Sometimes elite burials can be identified by their inclusion of textiles featuring elements of gold and silver. Stone sarcophagi are a further sign of costly burials, along with expensive carved tall whitestone tomb slabs. A new method of identifying elite burials is based on deducing the diet of deceased from bone analysis. Data from burials shows an overwhelming majority of individuals whose diet had heavily consisted of animal protein among elite burials, compared to a more typical diet of plant-based food from non-elite graves.

11 ELITE COFFINS FROM 17-18TH CENTURY IN NORTHERN AND EASTERN POLAND

Author(s): Majorek, Magdalena (Institute of Archaeology, NCU in Toruń (Poland))

Presentation Format: Oral

Archaeological excavations inside churches and cemeteries in Poland have intensified in recent years (2010-2017). They proved that wealthier representatives were buried in churches (in crypts and under the nave and presbytery). Poor ones - in cemeteries. Coffins from crypts in northern and eastern Poland were characterized by:

- good state of preservation, enabling to identify their metrical features;
- wood as construction material;
- decorative elements – lack of handles, rarely supports in forms of circular thrown legs (from 4 to 6 items), different in size, depending on placing them in the coffin bottom; higher and most protruding legs situated in the broadest and highest coffin part;
- painting was the main decoration, although some of them were upholstered with silk or wool textile and decorative ribbons;
- main colors used for coffin painting included: white, blue, red, black, rarely brown, yellow, orange, but mainly in details;
- coffins were monochromatic with applying various decorative elements – plant motifs in predomination – branches in color contrasting with the background, e.g.: red on blue background, also rivet imitations, painted at edges and joins;
- shorter walls in majority had Marian symbols (at leg sides) and IHS (short walls at heads); painted crosses on many tops in a color different than the surface;
- in some cases there were remains of initial letters of names and surnames painted or studded and the date of death.

In my speech, I will try to answer the following questions: What elements of coffins influence the identification of the deceased? What affects to the interpretation of the burial as a burial of an elite member. Is it facilitated by the symbols (crosses, monograms, skulls), colorful ornaments or upholstery fabrics discovered on the surface of the coffins?

12 TOURNAMENTS – IMAGE(S) OF A GERMAN ELITE IN THE 14TH-16TH CENTURIES

Author(s): Brenker, Fabian (University of Innsbruck)

Presentation Format: Oral

Beginning in the 14th century and ending in the 16th century wall paintings, stove tiles and other objects in the domestic context such as windows, toys and furniture were decorated with lance-bearing horse-riders. Not all of them are really showing knights at tournament. In consideration of arms and armour some of them can be sorted out as St. Georg or knights in battle. One may not be surprised to find these pictures and objects in castles. But an important amount of them can be associated with elites from towns such as Nuremberg or Augsburg. With help of written sources and heraldic symbols it is often possible to identify the clients. It has been worked out that the tournament scene itself was not just any image. Within the pictures of this elite occupation other messages such as remembrance or social network have been transmitted. Others used it as a social genre. Regarding the message of each individual tournament picture one can define groups which correspond for the most part with different elite groups and regions such as nobility, jousting patricians of imperial cities in southern Germany, functional elites in Tyrol or aristocrats in the Swiss confederation. Even if they differ in their way of power and administrative function, they tried to share a common 'habitus' and with that distinguished from others.

13 RURAL SOCIAL GROUPS AND THEIR EMBLEMATIC MATERIAL CULTURE – ARCHAEOLOGICAL PERSPECTIVES ON LATE-MEDIEVAL NORTHERN GERMANY

Author(s): Biermann, Felix (Greifswald University)

Presentation Format: Oral

The different social groups in the countryside – petty nobility, farmers, crofters („Kossäten“) etc. – maintained different habitus in the high and late Middle Ages, expressed their rank by special customs, various dress codes, behaviour, lifestyle, consumption. Because written sources grant only limited insight in the rural milieu, archaeological material culture is significant for investigations into social groups and their relations, in particular also for élites behaviour: Social rank was expressed by dress ornaments, jewellery, special everyday life utensils; many things had even mainly a socially emblematic function, as status symbols or prestige objects.

However, the cultural-historical analysis of findings for questions into social groups and their relations is complicated by different aspects, beneath them the two following: Firstly, the social groups orientated mutually. For instance, the life and dress culture of the nobility was also imitated by wealthy farmers; thus, single findings cannot be connected with the social rank of the former owner without further ado. Secondly, the comparison of the material culture of different sites is difficult, because the amount and significance of the finding material is affected by various factors – type of site, extent and quality of the excavation or survey, conditions of preservation etc. – limiting the information on historical reality.

In Northern Germany numerous excavations in castles of the low nobility as well as in deserted villages, churches and cemeteries have occurred during the last years. Moreover, metal detector surveys are increasingly common as an instrument of scientific research. The basis for research into the social function of medieval material culture, just also to the élite culture, has thereby improved decisively. On this basis the paper examines the customs, lifestyle and mutual relations of rural social groups of the 12th-15th century and their emblematic material culture, under consideration of the methodological chances and problems.

14 ACADEMIC ELITES AND EARLY ARCHAEOLOGY – THE CASE OF KILLIAN STOBÆUS (1690-1742)

Author(s): Naum, Magdalena (Aarhus University)

Presentation Format: Oral

The paper describes collecting of and research on antiquities and archaeological objects conducted by Killian Stobæus (1690-1742), professor in nature history, experimental physics and history at Lund University in Sweden and the founder of Museum Stobæanum. Reviewing Stobæus's collection of archaeological artefacts, his way of collecting and displaying them, as well as his research on these objects, my paper addresses Stobæus's personal interests and his methods of scientific examination of the antiquities. Special attention is paid to his dissertation "[Miolner hamar Thors], seu ceraunii betulique lapides disputatione historica illustrati", in which he describes some of the artefacts in his possession and puts forward theories of their origins and meaning. Killian Stobæus's collecting interests and practices are placed in a wider cultural context. In the European societies, furnishing museums, collecting and studying acquired objects became a distinctive pastime of the early modern upper class and educated middle classes. This practice was one of defining aspects of the 17th and 18th century elites. Elites thus, stood at the forefront of intense engagements and theorization of the material world. The case of Killian Stobæus provides glimpses of how the Enlightenment academics engaged with the ideas of the past through material evidence of archaeological objects.

a. POOR NOBILITY OR RICH PEASANTRY? A BURIAL OF A CHILD FROM THE CHURCH OF THE HOLY TRINITY IN BYSZEWÓ (POLAND)

Author(s): Nowak, Sebastian (Nicolaus Copernicus University i Torun)

Presentation Format: Poster

Burials found under the church floor or in burial crypts are usually identified with the dead of more or less wealthy noble families. Meanwhile, recent archaeological and historical studies show that at least some of the graves could have belonged to people of much lower social status. Written sources mention rich peasants, buried in the temples among the others in Płonkowo and Byszewó (Kuyavian-Pomeranian Voivodeship, Poland).

As a part of the poster, one of the wealthy child burial will be presented (coffin No. 44/2018) from the southern crypt in the church of the Holy Trinity in Byszewó. The dead child was equipped with grave clothes decorated with appliques of silk haberdashery and semi-precious metals. The burial wreath was additionally decorated with artificial flowers made of silk yarn and metal wires imitating gold. Noteworthy is also the large amount of plant remains, originally located inside a coffin. The results of technological analysis of fabrics, as well as material and technological analyzes of other elements included in the funeral equipment will be presented, with an attempt to interpret them. In-situ documentation will allow to present individual elements on a detailed burial plan. It will also be a brief discussion of the proposed documentation of the funerary equipment that was used during the work.

b. DO ELITES RIDE THE SOCIETY? QUESTIONS ASKED BY THE RECONSTRUCTION OF THE 15TH C. SADDLE OF SENONCHES (FRANCE)

Author(s): Borderie, Quentin - Fencke, Emilie (Departement Eure-et-Loir) - Dumont, Adeline (Les renes de l'histoire)

Presentation Format: Poster

Preserved mediaeval saddles are extremely rare in Europe, especially in France. In 2006, rescue excavations were undertaken in the castle of Senonches (Centre-Val-de-Loire, France). They permitted to unearth an exceptional saddle, which included gold parts but was strongly altered. Since the field, questions were asked about the nature of this object: was it a war saddle, an apparatus good or a high-status social gift? To answer to these questions, the saddle was finely analyzed in laboratory, in order to identify every piece of the remains, to understand the process of manufacturing, and to assess the possibility of its usage. Moreover, a rideable reconstruction was crafted. It appeared that the saddle was made by very diverse materials, such as beech wood, copper alloy with mercury gilded, iron, and different kinds of leather and glass paste in addition to gold leaves. A blazon was discovered, referring to the family of Morhier, which was settled 40km in the east. The morphology of the saddle fits to luxurious war saddle, or tournaments saddle. Thus, several tests were made by museum specialists of ancient horse-riding, with different horses, even in combat conditions. This paper will focus on the information given by this innovative scientific and experimental approach of the archaeological artefact. Of course, this study permitted to better understand the horse-riding practices, but also it allows us to discuss the questions of the relation between luxury goods, social relation and archaeological interpretations of social status.

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FROM DATA DESCRIPTION TO HISTORICAL EXPLANATION IN ARCHAEOLOGICAL SPATIAL ANALYSIS: INTEGRATING GEOSTATISTICAL METHODOLOGY AND SOCIAL THEORETICAL MODELS

Theme: Theories and methods in archaeological sciences

Organisers: Morera Noguera, Núria (Laboratori d'Arqueologia Quantitativa - LAQU, Universitat Autònoma de Barcelona) - Achino, Katia Francesca (Institute of Archaeology ZRC SAZU; Laboratori d'Arqueologia Quantitativa - LAQU, Universitat Autònoma de Barcelona) - García-Piquer, Albert (Arqueologia de la Gestió i dels Recursos Socials i Territorials - AGREST; Departament de Prehistòria, Universitat Autònoma de Barcelona)

Format: Regular session

The application of GIS technologies to solve archaeological questions related to spatial issues has nearly become an imperative during last decades. This has implied an exponential applicability of such methodologies in the field of archaeology, both in macro and micro scale. However, despite their implementation, mostly through geostatistical tools, deeper interpretations of the archaeological georeferenced record, regarding social strategies – productive and consumption activities – have been poorly carried out. Nevertheless, recent studies have shown that combining different sources of data – such as ethnographical literature, ethnoarchaeological observations, use-wear analysis or soil chemical analysis – to the geostatistical techniques mainly applied – spatial interpolation, spatial autocorrelation, spatial association, among others – could be useful to overcome the aforementioned limitation.

The aim of this session is to build a reflexive discussion regarding the different theoretical and methodological approaches on this scope. Specific focus will be devoted to compare the meaning and analytical connotations of the terminologies and models used in archaeological case studies of different chronologies and social forms of organization. Therefore, we strongly welcome theoretical and practical contributions in geostatistical spatial analysis that have included social theory.

ABSTRACTS

01 FROM NUMBERS TO PEOPLE: QUANTITATIVE NARRATIVES TO UNDERSTAND TRYPILLIA MEGA-SITES OF CHALCOLITHIC UKRAINE

Author(s): Nebbia, Marco (Durham University) - Gaydarska, Bisserka (Independent Researcher) - Chapman, John (Durham University)

Presentation Format: Oral

This paper investigates the development of the largest sites – mega-sites – in Europe during the Chalcolithic (4th millennium BC) and seeks to discuss their urban nature within the wider settlement context of the Trypillia group in modern Ukraine.

Quantitative geostatistical analyses are performed in order to describe trans-scalar patterns in the settlement data, and an interpretative narrative is proposed to explain these patterns and their relevance for the definition of the 'urban' nature of megasites. First and second order characteristics of point pattern analysis are investigated in order to propose a way of 'measuring' the centrality of these mega-sites within their coeval settlements, as well as understanding the scale of their hinterlands. Concepts like 'seasonality' and 'heterarchy' are used to explain the development and the social organization of mega-sites, which are conceived as temporary gathering places where an 'urban-like' identity starts to develop.

In an age where bigger and bigger datasets are available to the archaeological research, it is fundamental to foreground the meaning

of large-scale patterns and the relationship that these have with the in(dividual) scale.

The results of this research are not only shedding new light to the specific field of Trypillia archaeology, but they can also provide new insights to the wider investigation on the origins of global urbanism and human agglomeration dynamics.

02 IRON AGE AND ROMAN LANDSCAPE ANALYSIS THROUGH GEOSPATIAL TOOLS. A MACRO SPATIAL STUDY OF CITÂNIA DE SANFINS (PORTUGAL)

Author(s): Botica, Natalia - Maciel, Sílvia (University of Minho) - Blanco-Rotea, Rebeca (University of Santiago de Compostela; University of Minho)

Presentation Format: Oral

The study of landscape in the Iron Age and romanization of the north of Portugal represents itself as a very complex and intriguing approach. In this paper we intend to show the methodology developed for the study of the existing diachronic and synchronic relationships in the landscape concerning Citânia de Sanfins and the involving territory, as well as the existing settlements and resources. For this we are using an Information System that is able to input data from research work such as bibliography, archaeological excavations, cartography and photography. We can also integrate in a database new data produced during the development of this project, resulting from spatial analysis as visibility, accessibility and the economical and social dynamics of the territory, being a tool that is actively connected with the SIG. Also it works as a digital archive of the existing data facilitating the dissemination of the information as well as its reuse in future studies. With this work we hope to contribute for the definition of a model of landscape analysis in this territory for this period, trying to understand for it the relationships between the Citânia de Sanfins, the largest settlement that is located in a central place, and the other settlements and the accessibility to the resources of the zone.

03 MODELLING LONG-TERM HUMAN OCCUPATION IN THE CENTRAL PYRENEES. INSIGHTS INTO THE HISTORY OF A HIGH-ALTITUDE LANDSCAPE

Author(s): Gassiot Ballbè, Ermengol - Garcia casas, David - Salvador Baiges, Guillem - Nunes Alonso, Joan - Rodríguez Antón, David - Obea Gómez, Laura (Universitat Autònoma de Barcelona) - Mazzucco, Niccolò (Université Paris Ouest Nanterre) - Quesada Carrasco, Manuel (Universitat Autònoma de Barcelona) - Clemente Conte, Ignacio (Consejo Superior de Investigaciones Científicas - CSIC) - Díaz Bonilla, Sara (Universitat Autònoma de Barcelona)

Presentation Format: Oral

During the last 15 years, the Grup d'Arqueologia de l'Alta Muntanya of the Universitat Autònoma de Barcelona has carried out archaeological surveys and test excavations in high altitude areas of the Central Pyrenees. More than 300 archaeological sites have been recorded in the National Park of Aigüestortes i Estany de Sant Maurici. In this communication we present the recent advances in the modelling of the human occupation of the mountain landscape during the Holocene. Our goal is to understand the social and historical dynamics of the groups that inhabited the Central Pyrenees from a diachronic perspective. Following this aim we have designed a Geographical Information System that collects all the archaeological information gathered during the surveys, integrating diverse type of data at different spatial and chronological scales, from the site-level to the single structural or stratigraphic unit. After that, we have been investigating the spatial relationship between the various archaeological sites at a regional scale, and between the sites and the surrounding environment. This information system has been integrated with ethnographic information about contemporary and twentieth-century land use (i.e. traditional transhumance or coal production). Thanks to this integrated approach, a long term-perspective on the exploitation of the Pyrenean high altitude areas has been achieved.

04 NEW INSIGHTS ON A LOCATION THEORY FOR RURAL SETTLEMENT

Author(s): Negre, Joan (LAQu - UAB)

Presentation Format: Oral

The use of spatial statistics in archaeology can be traced back to the advent of geographic quantitative approaches over the past several decades. In this context, different authors have developed approaches for analysing settlement patterns using different statistical methods.

However, we want to emphasise a remaining concern regarding the study of settlement patterns: while technical improvements are increasing in quantity and quality, these advances are generally lacking in historical insight. A settlement theory that generalises regularities in location strategies and spatial behaviours for different historical scenarios is still pending.

In this line of research, the discussions on rural settlement and spatial behaviours available in the Annals of the Association of American Geographers are worth mentioning. In those works, the authors proposed using spatial processes similar to those described for plant ecology in order to explain changes in habitat locations over time. Social dynamics like colonisation, spreading and competition, among others, were defined in terms of the distribution patterns they generated. Other works in this same direction defend, for example, the influence of urban cores (i.e. sites presenting a concentration of wealth and capital, individual enrichment and class formation, among other aspects) on the spatial structure of rural periphery.

In our contribution we aim to develop a theoretical framework by approaching the nature of spatial aggregation and social clustering as an obvious consequence of social interaction. In particular, we want to examine the spatial relationship of different activities and whether such relationships sprang more from social decisions than the limitations imposed by the physical features of the land.

The development of models that capture the complex relationships between spatial regularity modalities and social processes can greatly complement ground-breaking methodological advances, allowing a better understanding of our reality.

05 GEOMEASURE: GIS AND SCRIPTING FOR MEASURING VARIABILITY

Author(s): Cortell-Nicolau, Alfredo (PREMEDOC Research Group, Departament de Prehistòria, Arqueologia i Història Antiga, Universitat de València)

Presentation Format: Oral

While accurateness is crucial for correctly recording archaeological data, figuring out the way in which we achieve the resolution required is one of our greatest challenges. These difficulties might increase as the size of our proxies decrease. Such is the case of the geometric microliths. The size of these pieces, widely often < 2mm, and the high number of aspects determining their variability has led us to develop a system by which we can measure a great number of variables both, rapidly and accurately.

By combining GIS techniques, such as georeference, grid-use and geospatial measuring, with R and/or Python code -which allows us to automatize most of the process, thus increasing our speed and productivity-, we can have access, not only to more complete and detailed measures, but also to an accurateness, which we could have not achieved by using callipers. All of this allows us to increase our understanding of many stylistic variability patterns subsumed into broader social processes.

So far, the system has been implemented for one very specific aim, which is to measure geometric microliths, but the mixture of different types of grids permits deploying further functions and actions for all kinds of scales and needs. Plus, the development of the code, both in R and Python, brings the method the possibility to work as a stand-alone project, as well as inserted as a core GIS function

06 EARLY MESOLITHIC SITES - INTERPRETATIONAL POSSIBILITIES IN DISTRIBUTION OF TOOLS AND RAW MATERIALS

Author(s): Neroy, Arne Johan (Museum of archaeology, University of Stavanger)

Presentation Format: Oral

Early Mesolithic hunter-gatherers in Norway were highly mobile as reflected by site structures and lithic assemblages. The population is viewed as family based in a residentially mobile settlement pattern primarily based on marine resources but utilization of mountain resources have also been documented. A case study of a mountain site from western Norway with two tent rings and associated fireplaces explores interpretative possibilities in analysing distribution of raw materials and tools. All lithic raw materials have been transported to the site. The flint have been transported over long distances from the coast whereas the quartz and rock crystal are of a local origin. The site is an isolated entity, which constitutes an interesting case study concerning the transport and use of raw material as reflected by site distributional patterns. A preliminary analysis indicate distinct patterns in the distribution of the same general types of flint associated with two separate tent rings located close to each other on a lake-shore 750 m. above sea-level. These patterns and degrees of variation on the micro-level are important to study in terms of the composition of the social groups involved and their functional pattern of behaviour. The behavioural and social significance of the distributional patterns in terms of our understanding of the EM social structure and subsistence pattern will be discussed.

07 ASSESSING SPATIAL ORGANISATION AND REFUSE MANAGEMENT PATTERNS OF AN EARLY NEOLITHIC SETTLEMENT THROUGH LITHIC DEBITAGE AND TOOLS DISTRIBUTION

Author(s): Ehlert, Maciej (Archeolodzy.org) - Cendrowska, Marzena (Archeolodzy.org; PhD programme in Cultural Studies, Faculty of Historical and Pedagogical Sciences, University of Wrocław) - Mackiewicz, Maksym (Archeolodzy.org) - Furmanek, Mirosław (Institute of Archaeology, University of Wrocław)

Presentation Format: Oral

Recent expansion of a factory encroaching on a rich, multiphase site in Kornice (near Racibórz, Śląskie voivodship, Poland) necessitated carrying out large-scale rescue excavations. The project encompassed a great area and yielded many finds that greatly enhanced our knowledge of many parts of prehistory of Moravian Gate's northern rim.

During the 2017 season, remains of an early Neolithic settlement including 10 shallow, irregularly shaped pits were discovered. Their fills contained no macroscopic organic remains. However, varied amounts of ceramic shards and flint artefacts (from 1 to over 8000) of the Malice culture (4670 - 4400 BC) were discovered. As no other traces of the settlement were found and the shards were badly eroded, the ubiquitous, well preserved and precisely mapped lithics became the main focal point of our preliminary spatial analysis.

A set of basic features of the flint artefacts was chosen, such as size, raw material (local or imported), position in manufacture and use sequence, presence/absence of patina and heat damage. These features were then mapped and compiled using GIS tools, in order to provide otherwise undetectable clues about spatial patterns of artefact use and discard, formation processes of the features, as well as refuse management within the settlement.

08 SPATIAL INFERENCES AND SOCIAL EXPLANATION AT A NEOLITHIC SITE

Author(s): Morera Noguera, Núria - Barceló, Juan Antonio (Departament de Prehistòria, Universitat Autònoma de Barcelona) - Palomo, Antoni (Museu d'Arqueologia de Catalunya) - Piqué, Raquel (Departament de Prehistòria, Universitat Autònoma de Barcelona)

Presentation Format: Oral

La Draga (Banyoles, Girona) is a pile-dwelling settlement that was occupied uninterruptedly between the ca. 5300-4800 BC. The archaeological site of La Draga stands out for being one of the first evidences of the Neolithisation process in the Western Mediterranean and for the extraordinary preservation of the archaeological organic remains. Both allows carrying out studies about the subsistence and technological strategies taken by the first farming societies.

In this paper, we discuss the application of geostatistical methods to obtain information regarding the spatial organization of this Neolithic community, and to reconstruct its social organization for the development of productive and consumption activities. To do so, we present the nature of the spatial evidences and we apply different techniques of density analysis and spatial autocorrelation to test different hypotheses about social organization. Beyond the specific techniques of spatial analysis, the emphasis is placed on the theoretical framework that has been elaborated for the specific case-study. Exemplifying the same, first farming societies are usually considered as ideal egalitarian communities with low degrees of social division of labour and poor development of means of production. Therefore, for a proper spatial analysis, those historical and social hypotheses should be presented in form of statistical hypotheses, and this constitutes the core of the paper. Our intention is to translate different social assumptions about the development of means of production in these historical circumstances in terms of degree of spatial autocorrelation and of probabilities of spatially dense patterns for different artefactual categories.

09 VALIDATING THE ROLE OF POST-DEPOSITIONAL PROCESSES BY INTRA-SITE SPATIAL ANALYSIS: SLOVENIAN PILE-DWELLING CASE STUDY

Author(s): Achino, Katia Francesca (Institute of Archaeology ZRC SAZU, Ljubljana; Quantitative Archaeology Lab - LAQU, Department of Prehistory, Autonomous University of Barcelona) - Toškan, Borut - Velušček, Anton (Institute of Archaeology ZRC SAZU, Ljubljana)

Presentation Format: Oral

Intra-site spatial analyses have proved their strength in reconstructing the differential use of space within archaeological contexts, highlighting, for instance, the presence of activity areas. However, these assumptions are reliable whether the archaeological record and its formation and deformation processes have been studied in detail and the original spatial distribution of the archaeological markers is preserved. This communication presents the results of a different application of intra-site spatial analysis: it proves the relevance of these techniques also as a means of testing the integrity of the archaeological record, even in "unfamiliar", post-depositionally affected contexts. The Slovenian pile-dwelling of Resnikov prekop represents a good pilot case study, since the nature and the potential effects of deformation processes have been reconstructed through a multidisciplinary approach. Spatial analysis can consequently reconstruct specific spatial patterns for decisive categories of evidence produced as effect of these deformation processes. The comparison between results of both such approaches contribute to corroborate assessments of role played by post-depositional processes, in changing the original spatial distribution of these archaeological markers. This assumption will shed new light on the formation and deformation processes which took place at the site, as well as on the interpretation of the spatial patterns observed.

10 PLEASE DON'T STEP ON THE SITE! INVESTIGATING THE EFFECT OF TRAMPLING ON ARCHAEOLOGICAL ASSEMBLAGES, USING SPATIAL STATISTICS AND ETHNOARCHAEOLOGICAL INFERENCES

Author(s): Carrer, Francesco (Newcastle University)

Presentation Format: Oral

Understanding the effect of trampling on the preservation and spatial organisation of archaeological assemblages is crucial for inferring the use of intra-site space in the past. Spatial patterns of artefacts/ecofacts within archaeological sites are generally believed to mirror the original organisation of activity areas, but this assumption underestimates the fragmentation and displacement of debris caused by intensive trampling. Since the 1980s, experimental archaeology and ethnoarchaeology have investigated intra-site trampling, producing useful insights for the interpretation of archaeological records. However, they have not been able to provide a reliable method to: (a) assess the occurrence of trampling in an intra-site context and (b) identify those sectors of the investigated assemblage less affected by trampling. This paper will present a novel approach based on the use of spatial statistics, which specifically addresses these two methodological issues. Previous studies have suggested a correlation between size/preservation of artefacts/ecofacts and their spatial location: bulky objects tend to be displaced in marginal areas, whereas objects scattered in highly trampled sectors of the site tend to be smaller and more fragmented. This property of spatial features is known as spatial autocorrelation or spatial dependency, and can be explored using various dedicated methods. In addition to this, local tests of spatial dependency, enable clusters of positively-autocorrelated ("hot-spots") and negatively-autocorrelated ("cold-spots") objects to be highlighted. Using this toolset, the author has devised a protocol for the assessment and detailed analysis of trampling in small intra-site spaces. In order to test this protocol, an ethnoarchaeological case-study is used: a pastoral hut seasonally exploited by cattle herders in the Italian Maritime Alps. Direct observations of the activities carried out in the hut, and of the intra-site mobility patterns, were used to compare the results of the spatial analysis with expected theoretical patterns.

11 RECONSTRUCTING ORGANIZATIONAL STRATEGIES AND SOCIAL USE OF SPACE IN TWO ETHNO-ARCHAEOLOGICAL YAMANA SHELL MIDDENS OF TIERRA DEL FUEGO, ARGENTINA

Author(s): Garcia-Piquer, Albert - Solà, Judit - Estévez, Jordi (Laboratory of Archaeozoology; Autonomous University of Barcelona)

Presentation Format: Oral

Though randomness and variability are expected, human activity is the consequence of organized activities that are carried out by women and men in a particular temporal and spatial sequence. It is a concrete "organizational strategy" regulated by social norms what defines every society. Consequently, social activities (temporal and spatial discontinuities) and social relationships (levels of aggregation and disaggregation of human interactions) are reflected in the archaeological materiality. In this research an ethnoarchaeological approach was developed in order to test the explanatory potential of archaeological categories, as well as the level of resolution of spatial and geostatistical methods.

The results of the analysis of ethnographic and archaeological data from Yamana Hunter-Gatherer-Fisher society (Tierra del Fuego, Argentina) are presented. Data was combined to propose significant associations between production and consumption activities and the spatial distribution of their waste and debris. Particular emphasis was placed on engendered-division of productive and social reproductive activities, and the calculation of time (value) spent on them by each social agent: men, women, male and female children. These concrete social categories were subsequently applied in the intra-site spatial analysis of Túnel VII and Lanashuaia, two ethnohistoric archaeological sites located in the northern coast of the Beagle Channel (Tierra del Fuego, Argentina). Results reveal that such an approach can be encouragingly used in differentiating discrete analytical levels among the archaeological spatiotemporal structure and thus reconstructing concrete organizational strategies.

12 THE DOMESTIC ROUTES OF A HOUSEHOLD

Author(s): Yalman, Emine Nurcan (Nişantaşı University Dept of History, Istanbul)

Presentation Format: Oral

Household archaeology and ethnoarchaeological studies on this topic show parallel developments. As noted by Wilk and Radje (1982) archaeologists do not dig up households; they dig up dwellings and domestic artefacts but not social units. This ethnoarchaeological presentation is based on a comparative analysis of the data from two contemporary settlements in Central Anatolia. Although these settlements and their residents are located in the same (Central Anatolia) region, and have same religion and ethnic backgrounds, the formation of their settlements, social layouts and household organizations show very distinctive variation. After discussing these variations, this paper will scrutinize the daily activity routes of household members during a day within a compound/house. The documentation of daily activity routes does not only provide a through methodology of spatial analysis in a domestic space but more importantly it reveals the space usage on the basis of age, gender as well as social hierarchy. Although the routes represent one day activity within a house or a compound, it still reflects repetitive pattern of movements of everyday life. Another important subject that is observed in this research is the territoriality within the domestic spaces. In addition, it contextualizes these small-scale actions within the large-scale general community behaviour, which is responsible for the overall layout and functioning of the settlement.

438 NOT ONLY USE: APPLICATION OF FUNCTIONAL METHODS FOR A BETTER COMPREHENSION OF OPERATIVE CHAINS

Theme: Theories and methods in archaeological sciences

Organisers: Fernández Marchena, Juan Luis (SERP, Seminari d'Estudis i Recerques Prehistòriques. Secció de Prehistòria i Arqueologia, Facultat de Geografia i Història, Universitat de Barcelona) - Asryan, Lena (Artsakh State University) - Pederghana, Antonella (Laboratory for Traceology and Controlled Experiments - TraCER, MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution) - Ollé, Andreu (IPHES, Institut Català de Paleoeologia Humana i Evolució Social; Àrea de Prehistòria, Universitat Rovira i Virgili, Fac. de Lletres)

Format: Regular session

In the past few years, new approaches emerged in wear studies including a wide variety of new analytical methods. Moreover, these studies have been frequently supported by experimental data in order to better interpret the archaeological record. The growing interest in understanding the function of objects has also enhanced to expand the materials (e.g. rock, shell, bone, metal, pottery) and types of objects (e.g. cutting tools, scrapers, ornaments, vessels) analysed.

One of the aims of this session is to bring together different methodologies used in wear studies and to take advantages of multidisciplinary studies of traces of different origin (i.e. technological marks, use-wear, post-depositional alteration marks and residues). Finally, in this session we aim to discuss the reconstruction of operative chain starting from object manufacture to its use and discard at the site.

Therefore, we invite presentations related to the study of marks resulting from production, use and post-depositional processes that will attempt to integrate different activities and different raw materials in both experimental and archaeological assemblages.

We also welcome contributions on the application of new methodologies with high diagnostic value to analyse traces of different origin. Com-

bination of different methodologies and microscopic study techniques will be one of the central issues in this session. Furthermore, the development of new experiments and experimental protocols related to the formation of different traces on artefacts of different raw materials will have an important role within this session.

ABSTRACTS

01 **CLEANING STONE TOOL SURFACES PRIOR TO MICROSCOPIC SCANNING: TOWARD AN EXPERIMENTALLY TESTED PROTOCOL**

Author(s): Pedernana, Antonella - Gneisinger, Walter - Calandra, Ivan (TraCEr, MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, Neuwied) - Paixão, Eduardo (TraCEr, MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, Neuwied, Germany; ICArEHB - Interdisciplinary Center for Archaeology and Evolution of Human Behaviour. University of Algarve) - Schunk, Lisa - Marreiros, João (TraCEr, MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, Neuwied)

Presentation Format: Oral

Cleaning stone tool surfaces prior to any microscopic observation is a necessary step in any functional analysis. This is done to remove any undesired substance (e.g. contaminants, sediment concretions, ink and varnish) which would cover use-wear features.

Different protocols are adopted in different laboratories, depending on personal preference or experience, but they are not always adequately described in publications.

The main issue connected with this disparity of the applied standards is that results are hardly comparable and not reproducible. There is also an underestimation of the possible impact that the selected cleaning protocols and the handling of the objects during other analyses might have on the functional analysis itself.

With this purpose in mind, we undertook controlled experiments to test commonly applied cleaning procedures. One of the main aims of the experiments was to assess the effects of brushing actions on flint surfaces to remove sediment particles. To quantify any changes in the micro-topography, surfaces were analysed before and after cleaning by using a unique sample coordinate system in conjunction with a laser confocal microscope. Relative roughness of the surfaces was compared before and after cleaning and the surfaces were microscopically scanned to detect possible wear formed due to the contact with the sediment particles.

The experimental results will form the basis for establishing a cleaning protocol to be adopted by the TraCEr laboratory.

02 **THE MULTI-ANALYTICAL CONTEXTUAL APPROACH. AN EXAMPLE OF A SYSTEMATIC CHARACTERIZATION OF FRESH RESIDUES ON EXPERIMENTAL FLINT TOOLS**

Author(s): Martin-Viveros, Juan Ignacio (Área de Prehistoria, Universidad Rovira i Virgili, Facultat de Letras; IPHES, Institut Català de Paleoeologia Humana i Evolució Social) - Ollé, Andreu (IPHES, Institut Català de Paleoeologia Humana i Evolució Social; Àrea de Prehistoria, Universidad Rovira i Virgili, Facultat de Letras)

Presentation Format: Oral

Residue analysis is an analytical discipline aimed to provide clues about past tool function in archaeological contexts. Generally, three are the main limitations that the residue analyst has to face: the impact of different sedimentary environments in residue preservation, the causes of residue deposition, and the overlap in morphology between different use-related residues. In the last years, new contextual approaches, such as the multi-stranded approach, and analytical techniques, such as Raman spectroscopy or gas-chromatography-mass spectroscopy, have made progress facing these limitations. However, little attention has been paid to chemical analyses in those contextual approaches which have taken into account the association of criteria such as the distribution patterns and the visual appearance of residues.

In this work, we aim to test a multi-analytical contextual approach taking into account the association of criteria together with micro-chemical analysis to characterize fresh residues on experimental flint tools. Based on an experimental reference sample composed by animal and plant residues, we found out that the association of criteria (the distribution patterns, the relation of residues with the used edge, the disposition of specific tissues indicating directionality of tool motion, the association and the smearing aspect of residues, etc.) has allowed us to discern use-related from non-use related residues in many cases. Digital 3D microscopy was the main microscopic technique used in the contextual approach, followed by Optical Light Microscopy. However, some incidental and use-related residues exhibit ambiguous features that make them difficult to interpret even with the contextual approach. In these cases, the application of energy dispersive X-rays spectroscopy (SEM-EDX), and specially element maps, added resolution to the association of criteria. Although more experiments are needed, the multi-analytical contextual approach brings together two complementary approaches in residue analysis, and provides an example of a systematic characterization of fresh residues before performing post depositional experiments.

03 LITHIC TOOLS FROM NAHAL HEMAR CAVE: RESIDUE AND USE-WEAR ANALYSES AT A RITUAL SITE

Author(s): Ibáñez, Juan (Spanish National Research Council - CSIC) - Estalayo, Estefanía - Aramendía, Julene - Madariaga, Juan Manuel (University of the Basque Country) - Borrell, Ferran - Mozota, Millán (CSIC) - Bar-Yosef, Ofer (Harvard University)

Presentation Format: Oral

The archaeological site of Nahal Hemar Cave (Israel) dates from the Middle PPNB, in the 8th millennium cal BC. The archaeological materials discovered in this small cave located on a cliff near the Dead Sea show very specific characteristics, including masks, fragments of sculptures, one decorated skull, human figurines made of bone... This assemblage has been interpreted as a cache of ritual nature. Lithic tools were also found in the cave. All the artifacts are finished tools. Among them, the discovery of a complete sickle, with flint blades inserted into a wooden haft outstands. The most common tool is the called Nahal Hemar knife, a pointed bipolar blade with double basal notches. In order to know the use of lithic tools recovered at this site, 50 instruments (Nahal Hemar knives, sickle elements, projectiles...) have been studied, analyzing residues and use-wear observed on these tools. For residue analysis, non-destructive analytical techniques were used, namely Raman spectroscopy for the determination of the molecular composition and X-Ray Fluorescence for the determination of the elemental composition. Residues can be related both to the materials used for hafting and to the worked materials. This residue analysis plus the identification of use-wear indicates that the lithic tools from Nahal Hemar were used for an ample ensemble of functions.

04 ABOUT THE COPPER AGE CERAMIC LAMP FROM ZGORNJE RADVANJE AND SIMILAR FINDS IN THE CENTRAL AND SOUTHEASTERN EUROPE

Author(s): Kramberger, Bine (Institute for the protection of cultural heritage of Slovenia)

Presentation Format: Oral

Oval-shaped pottery finds with a flat base, dating between the Neolithic period and the Bronze Age, appear on many prehistoric sites of Central and Southeastern Europe. Their shape vary in the detail, however many of them appear with a spout, and some also with a solid handle. One such find - worth of our attention - was found also at the archaeological site Zgornje Radvanje, located in Northeastern Slovenia, while the excavation in 2007 and 2008. It was found in the earliest part of the settlement, dating to the Early Copper Age Lasinja Culture. According to the 14C AMS dates, this part of the settlement most likely existed maximally 146 years (with 95% probability) between 44th and 43d century BC. The object yielded traces of secondary burning and organic carbonized remains in a regular vertical pattern inside of the spout-shaped ending, therefore it was assumed that it could have functioned as a lamp and that traces of secondary burning could be the result of the controlled burning of the wick. To test this hypothesis different non-destructive analytical methods, as for example infrared spectroscopy (ATR IR) were implemented as well as mass spectrometry (MS). Additionally, an experiment with a replica was conducted. The results of X-ray fluorescence (XRF) indicate that the object was most likely made of local clay and it therefore goes about a local product. The find from Zgornje Radvanje is unique in its shape, however not without analogies. For the same site a similar find can be mentioned too, as well as some partly analogous oval-shaped finds from other Neolithic, Eneolithic, and also Bronze Age sites in Southeastern Europe. What was their function? Do they indeed represent some of the oldest known ceramic lamps in Europe?

05 MORE THAN VESSELS. MANUFACTURE AND USE OF GRAVE GOODS FROM FUNERARY CONTEXTS IN THE ARGARIC SETTLEMENT OF PEÑALOSA (JAÉN)

Author(s): García-García, Alejandra - Vico-Triguero, Laura - Alarcón-García, Eva (Department of Prehistory and Archaeology. University of Granada) - Cantarero-Malagón, Antonio Samuel (Department Analytical Chemistry. University of Granada) - Mora-González, Adrián (Department of Prehistory and Archaeology. University of Granada) - Padilla-Fernández, Juan Jesús (Department of Prehistory. University Complutense of Madrid) - Moreno-Onorato, Auxilio (Department of Prehistory and Archaeology. University of Granada) - Martín-Peinado, Francisco (Department of Edaphology and Agricultural Chemistry, University of Granada) - Manzano-Moreno, Eloísa (Department Analytical Chemistry. University of Granada) - Contreras-Cortés, Francisco (Department of Prehistory and Archaeology. University of Granada)

Presentation Format: Oral

The continuous need to move towards interdisciplinary studies, constitute the fundamental base of this study. The symbiosis between the techno-typological studies of ceramics and the studies of their organic residues in the Argar Culture had not been carried out in detail until now. Our case of study are vessels found in funerary contexts in the Argaric settlement of Peñalosa (Baños de la Encina, Jaén). They will provide new information about the manufacture, use and possible symbolism of them. We should not forget that this culture dedicates an important chapter to death, well-represented by wealth of their grave goods.

Organic residues analysis carried out to these ceramics will enable us to identify patterns of functionality and use in such contexts. For this purpose, we have applied chromatographic techniques that will identify the compounds associated with the contents of the vessels. On the other hand, the application of analytical techniques from Earth Sciences, based on the characterization of surfaces and ceramic pastes, allowed us to establish the first discussions about the production patterns of craftsmen and production modes of manufacture of the vessels, which were deposited in these contexts, as well as studies of origin of the raw material that makes up the ceramic pastes.

This research will bring to light the first results that will generate a debate between the vessels manufacturing process and the further use of the vessels placed in these funerary contexts.

06**SURFACE TREATMENTS IN NEOLITHIC POTTERY IN NORTHEASTERN OF IBERIAN PENINSULA: AN EXPERIMENTAL APPROACH**

Author(s): Díaz-Bonilla, Sara (Universitat Autònoma de Barcelona - CSIC-IMF) - Clop-García, Xavier - Gassiot-Ballbè, Ermengol (Universitat Autònoma de Barcelona) - Clemente-Conte, Ignacio Jesús (IMF-CSIC)

Presentation Format: Oral

As evidenced by the archaeology and ethnography, the treatment of the internal and external surfaces are indispensable. However, the references about such treatments are usually very concise and descriptive, far from the attention given to other aspects of products, such as their shapes or decorations.

The ceramic vessels are produced objects and, as such, they are the result of specific labor processes. Studying in detail the different aspects involved in the work process allows us to know aspects related to the specific forms of productive organization of the communities where pottery is produced. Treatments of the surfaces constitute an important phase of these production process. We'll study their specificities (to define with precision the treatment carried out, the tools used, the investment of work, the precise moment in the fact that these treatments are carried out, etc.). Therefore, it constitutes invaluable information to know the labor processes carried out in each case.

The adequate knowledge of the different aspects related to the treatment of the surfaces needs, nevertheless, the development of extensive experimental programs. That will allow knowing the different elements and processes implied. The main objective is establishing solid frames of reference that allow us analyzing and understanding the archaeological evidences.

In this work we offer the theoretical and methodological bases and the first results of a wide experimental program. That is being developed with the objective to study the surface treatments carried out in Neolithic ceramic products in the Northeast of the Iberian Peninsula.

07**COMBINED MICROSCOPIC TECHNIQUES FOR THE STUDY OF BONE, ANTLER AND TEETH SMALL FINDS. AN EXAMPLE FROM POLAND**

Author(s): Winnicka, Kinga (Institute of Archaeology, University of Wrocław, Poland)

Presentation Format: Oral

This presentation is based on my experience with different microscopic techniques utilised primarily during work on my PhD thesis Early Bronze Age Objects of Personal Use Made of Bone: Their Materiality and Meaning. The analysed material originates from two Early Bronze Age sepulchral sites in SE Poland (Mierzanowice culture; 2350-1600 BC). It consists of a variety of artefacts, mainly personal adornments made of bone, antler and teeth. Throughout the project much focus has been placed on beads of different shapes and sizes and pointed objects (interpreted as clothing pins and tools for fibre working). Observations were performed using conventional (light) microscopes – both stereoscopic and metallographic, scanning electron microscope (SEM) [coupled with energy-dispersive X-ray detector, EDS] and digital microscope (Hirox). Nowadays, these visual techniques are standard for analysing various aspects of artefacts' materiality: state of preservation (1), raw material differentiation (2), technological traces (3), use-related wear (5) and surface residues (5). Due to its anisotropic properties and erosion patterns (archaeological) bone can prove difficult to analyse under a microscope. In my presentation I will discuss the advantages and disadvantages of microscopic techniques for the analysis and recording of the five aspects of worked bone artefacts. Each point will be exemplified by photomicrographs and other data on analysed beads and pins.

08**KNAPPED BONES USED AS TOOLS: RESOLVING EQUIFINALITY THROUGH AN EXPERIMENTAL APPROACH**

Author(s): Mateo Lomba, Paula (IPHES, Institut Català de Paleoecologia Humana i Evolució Social) - Ollé, Andreu (IPHES, Institut Català de Paleoecologia Humana i Evolució Social; Àrea de Prehistòria, Universitat Rovira i Virgili - URV) - Cáceres, Isabel (Àrea de Prehistòria, Universitat Rovira i Virgili - URV; IPHES, Institut Català de Paleoecologia Humana i Evolució Social)

Presentation Format: Oral

Bone artefacts have been a topic widely discussed because of their problems of identification in ancient chronologies. Taphonomical and zooarcheological studies have pointed out problems of equifinality of biotic and/or abiotic agents that create pseudo-tools: marrow fracturing of green bone by hominins and carnivores, trampling, etc. Especially, the less elaborated bone tools are subject of problems of identification as artefacts, as the criteria for characterizing the patterns of elaboration are not clearly defined.

The aim of this study is to reconstruct the manufacture and use of poorly elaborated artefacts in order to evaluate their potential as tools involved in different activities, and to study the traces created by them. To achieve this goal, experimental bone breakage of bovid long bones is performed in order to consume marrow and to obtain blanks. The technique employed is the direct percussion on an anvil, involving different hammers (pebbles and choppers) to study the resulting different breakage patterns. Bone flakes are used unmodified in different tasks: scraping hide and wood, sawing wood, cutting meat and bone. Another set of bone blanks are knapped in order to shape bone tools, which are subsequently used in the same activities. This process is performed in a sequential way, recording the wear process with high definition moulds and casts of the active edges. In addition, cutmarks produced by carcass processing with bone tools are identified and described.

Thus, it is presented an interdisciplinary methodology to analyze the poorly elaborated bone tools from three perspectives: technol-

ogy, use-wear analysis and vertebrate taphonomy, globally supported by experimentation and microscopy techniques. The results achieved aim to explore the operative chain of used bones and knapped bone tools and their effects in the formation of different traces. Understanding these processes provides new clues for the study of hominins' subsistence strategies.

09 DIGGING STICKS DIGGING WHAT? TOOL MARK AND USE-WEAR ANALYSIS OF NEOLITHIC WOODEN POINTED STICKS

Author(s): Lopez-Bulto, Oriol (Universitat Autònoma de Barcelona; CSIC – IMF, Archaeology of Social Dynamics, Barcelona)

Presentation Format: Oral

The Early Neolithic site of la Draga (Banyoles, Spain) dates around 7000-7300 cal BP. The main relevance of the site is on the conservation of organic matter, a unique case in south-western Europe. Among other wooden tools, an ensemble of more than forty wooden pointed sticks stands out. Those constitute a heterogeneous ensemble in terms of dimensions, shapes, taxon of wood and tip morphology. Even though they have been interpreted as digging sticks (based on ethnography), these differences can indicate different functionalities. The aim of the work that it is presented is to understand the production processes (operative chain) as well as to determine differences in the functionality of the different wooden pointed sticks.

In order to fulfil those objectives an experimental program was developed, elaborating wooden pointed sticks and using them on different kinds of soils. Also, with those experimentations essential data was obtained in order to develop the traceological study of the wooden pointed sticks.

Those experimental replicas as well as the archaeological objects were analysed through 3D digital models. Since waterlogged wooden archaeological finds are fragile to manage and to analyse, 3D scanning and digital reconstruction showed up as the most efficient technique to analyse tool marks and use-wear.

10 DISCERNING DIACHRONIC FUNCTIONAL CHANGES IN THE SHORT-TERM OCCUPATIONS OF COVA FORADADA (CALAFELL, NE IBERIAN PENINSULA)

Author(s): Fernández Marchena, Juan Luis - Cebrià, Artur - Morales, Juan Ignacio - Fullola, Josep Maria (SERP, Seminari d'Estudis i Recerques Prehistòriques. Secció Prehistòria i Arqueologia, Facultat de Geografia i Història, Universitat de Barcelona)

Presentation Format: Oral

Foradada Cave (Calafell, NE Iberian Peninsula) is a small karstic system located 1.8km from the present shoreline and at 110 masl. The cave consists of two distinct areas, a strictly paleontological upper area, and a lower deposit in which the archaeological record is located. This second zone is a small room of 14 square meters and about 2 meters of sedimentary thickness in which there are at least 8 archaeo-sedimentary layers. The layer I consists of a recurrent collective inhumation dated back to the 3rd millennium cal. BC. Layer II is partially disturbed by the activities related with funeral use of the cave, but it is related to a Late Magdalenian phase. Layer III-n has been only partially preserved in a small sector of the cave and corresponds with a Gravettian phase. Layer III (Early Aurignacian) and IV (Châtelperronian) are completely intact, as it is a posterior phase still under excavation and review. Except for the funerary level, Cova Foradada presents very short-term human occupations, interspersed with the use of the cave as carnivore den. All occupations show scarce lithic assemblages, but typologically very diagnostic.

This work presents the results of the traceological and residue analysis of the lithic assemblages of the cave. The tools were analysed following a multianalytic protocol. For the first examination, the microscopic analysis was carried out with an optical microscope. When the pieces presented residues, these were analysed with the low-vacuum scanning electron microscope. Moreover, tools with macrowear (e.g. projectiles-like) were analysed with a 3D digital microscope.

The final objective is to document the diachronic differences in the use of lithic artefacts, between the Holocene and Palaeolithic phases, as well as to document the activities carried out by the hunting-gatherer groups in the small short-term occupations of the cave.

11 INVESTIGATING USE-WEAR ON PREHISTORIC TEXTILE TOOLS: THE CASE OF THE BRONZE AGE SICILY

Author(s): Zebrowska, Katarzyna (Institute of Archaeology, University of Warsaw)

Presentation Format: Oral

Textile tools (e.g. loom weights, spindle whorls, spools) state the unique evidence of textile production in Bronze Age Sicily (ca. 2200-850 BC). Since other sources (iconographical, written documents, pieces of cloth) are lacking from the area and period, the technology of textile production can be reconstructed only on the basis of the preserved implements. Their forms, dimensions, and weights, as well as use-wear marks visible on the surface, indicate the role of each object in the textile chaîne opératoire. The examination of wear is of special importance in cases when the function of a tool, or the proper way in which it was used in one of the steps of the process, is unclear.

The aim of this paper is to presents how a series of experiments (including spinning and weaving) conducted in controlled environment on clay copies of the original implements can contribute to the study of the use-wear marks characteristic for this class of objects. It aims at determining how different types of attrition, previously identified through macro- and microscopic observations of the artifacts' surface, appeared (as result of use, storage, post-depositional processes), verify the assumptions about the techniques of use of particular types of tools, and finally, provide a better understanding of specific activities performed within the

chaîne opératoire of prehistoric textile production.

12 BEARS (URSIDAE) AS LITHIC ASSEMBLAGE “MODIFIERS”

Author(s): Asryan, Lena (IPHES, Institut Català de Paleoecologia Humana i Evolució Social; Àrea de Prehistòria, Universitat Rovira i Virgili - URV; Artsakh State University) - Ollé, Andreu (IPHES, Institut Català de Paleoecologia Humana i Evolució Social; Àrea de Prehistòria, Universitat Rovira i Virgili - URV) - Camarós, Edgard (Instituto Internacional de Investigaciones Prehistóricas de Cantabria, IIPC, Universidad de Cantabria) - Moloney, Norah (University College London, Institute of Archaeology) - Fernández-Jalvo, Yolanda (Museo Nacional de Ciencias Naturales - CSIC)

Presentation Format: Oral

Bears were one of the most important predators inhabiting Middle to Upper Pleistocene cave-sites in Eurasia and, therefore, also one of the most important contributors to the taphonomic modification of geological and biological material at these sites.

This research originates from the study of archaeological lithic assemblages recovered from the Middle to Upper Pleistocene units of Azokh 1 Cave site in the Southern Caucasus. A study of these assemblages showed the presence of different types and degrees of mechanical alteration on lithic artefacts of different lithologies. In order to understand the origin of these alterations, an experiment with extant bears (*Ursus arctos*) was undertaken. As cave bear (*Ursus spelaeus*) was the dominant species in all the archaeological units of Azokh 1 Cave, the aim of this study was to explore experimentally the possibility of bear trampling as a potential agent of post-depositional surface modification on stone tools.

A set of experimental flakes of different raw was prepared and placed in an area at the Natural Park of Cábarceno (Cantabria, Spain) crossed exclusively by a population of bears. After three months, part of the experimental flakes were recovered and subjected to detailed macro- and microscopic studies combining different microscopes.

The study is still on-going and further results are expected after a longer experimental period and from other experimental conditions (in a rock-shelter). At this stage it is possible to say that in a relatively short time bears can cause important horizontal (> 6m) and some vertical dispersion of artefacts. Macroscopically, only slight changes were observed on some flakes. Microscopic study showed presence of some rounding and striations on the most elevated parts of basalt, obsidian and flint flakes. Moreover, the bears revealed to be potential modifying agents of the assemblage derived from their experimentally recorded biting and manipulation behaviour of lithics.

a. DRILLS AND HOLES - POTTERY MENDING AS EVIDENCE OF THE SOCIAL MEANING OF AN OBJECT

Author(s): Miloglav, Ina (University of Zagreb, Faculty of Humanities and Social Sciences, Department of Archaeology)

Presentation Format: Poster

In addition, to reconstruct and fully understand operational and behavioral chain in the life cycle of an artefact it is essential to consider marks that indicate the life of an artefact in a secondary context, where it can no longer be used for the primary function. Reused objects affect the total assemblage interpretation and have to be considered as part of the technological, economic, social and ideological context in which the technological choices were made.

Marks of repair on ceramic vessels are often completely ignored and usually not even recorded when processing and interpreting ceramic assemblages. The reason is perhaps in obvious traces that do not need further explanation or interpretation. But those signs are a very good mark of social, economic or ideological aspects of society that made those vessels and adaption of pottery to new purposes. Importantly, pottery repairs make it possible to investigate changes in the social meaning of an object, about its value for the owner or community and gives us a valuable information about changes in context and use of the artefact.

This paper presents results and interpretation of pottery repairs from the site in Eastern Croatia belonging to the Vučedol culture (Late Copper Age). Repair marks present on pottery vessels includes drilled holes along the breakages which are tied together with some organic material. Those marks are significantly more abundant than in any other prehistoric culture in this region. Analysis of repair marks (including traces and Freq-Mend statistic) shows that the most frequently mended forms are two types of utilitarian bowls which also showed a higher level of standardization in production and more frequent use. They evidently don't present economic need for repairing but suggests that they have certain socio-ideological meaning for the owner or community.

b. PHYSICAL-CHEMICAL METHODS AS SUPPORT FOR TRACEOLOGICAL ANALYSIS OF THE PREHISTORIC FLINT AND BONE ARTEFACTS. SELECTED EXAMPLES FROM POLAND

Author(s): Osipowicz, Grzegorz (Nicolaus Copernicus University/ Institute of Archaeology) - Bosiak, Mariusz (Nicolaus Copernicus University, Faculty of Chemistry) - Orłowska, Justyna (Nicolaus Copernicus University/ Institute of Archaeology)

Presentation Format: Poster

This poster presents the results of selected traceological analyzes of the prehistoric flint and osseous artefacts from the area of central Poland, in which for verification of the microscopic observations (technological and functional), various types of physical-chemical analyzes were used. The examples of application of such methods as: computed tomography, optical coherence tomography (OCT), scanning electron microscopy with an energy-dispersive X-ray spectroscopy detector (SEM-EDX), X-ray diffraction spectroscopy (XRD) and X-ray fluorescence spectroscopy (XRF) will be presented. These methods were used to verify the traceological observations referring to the type of tools used to create the analyzed products (form and raw material from which they were

made), general aspects of their production technology as well as individual types of activities performed during their performance, remnants of the probably ritual-like treatments observed on their surfaces and, finally, the type of raw material processed with their use, and thus the interpretation of their original function. It will be discussed the usefulness of the findings obtained thanks to the physical-chemical methods aforementioned, for the verification and supplementation of the information acquired through traceological analysis. From the other hand, also the reliability of microscopic analysis in the context of knowledge acquired through the use of modern physical-chemical methods will be verified.

The studies are funded by the scientific projects from the National Science Center (NCN) in Cracow (Poland) no. 2016/23/B/HS3/00689.

c. TOWARDS A STANDARDIZATION OF METHODS IN TRACEOLOGY: SETTING UP THE BASIS

Author(s): Pedergnana, Antonella - Calandra, Ivan - Gneisinger, Walter - Marreiros, João (TraCEr, MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, Neuwied)

Presentation Format: Poster

Understanding how artifacts were used in the past by humans is critical in the study of the evolution of human behavior. Although use-wear studies have shown promising results, a lot of criticism has been raised regarding standardization and reproducibility of methods.

Here we focus on three aspects of data acquisition and analysis that we believe represent fundamental steps toward standardized use-wear studies:

(1) Comparing surface topography before and after use: experimental use-wear studies classically focus on the wear produced during the experiments. However, tool production processes result in a unique topography on the created surfaces of the tool. This unused, post-production topography will, in turn, influence the subsequent development of use-wear. A complicating issue is that even two surfaces from the same sample will have different unused topographies. Here we present a simple protocol to precisely relocate a surface before, during and after an experiment, as well as for the re-analysis of the sample with different microscopes/methods.

(2) Quantifying use-wear: qualitative data are difficult to compare between studies, so we promote the use of a non-contact surface measuring microscope (confocal microscopy) to scan the surface of a sample in 3D. These 3D models can then be automatically analyzed to produce quantitative data that are statistically testable.

(3) Reporting of settings: the importance of equipment and analysis settings is often underestimated. Different pieces of equipment, objectives, light and analysis settings may all yield different results, both qualitatively and quantitatively. Here we list and discuss some of the relevant hardware and software settings that should be reported.

Ultimately, standardization will allow the sharing of data and the comparison, reproduction and replication of use-wear studies, lending more weight to our archeological interpretations.

d. HAMMER OR PESTLE? THE CONTEXT AND USE-WEAR ANALYSIS OF AN ANTLER TOOL FROM KOSTENKI 14, LAYER II

Author(s): Stepanova, Kseniya - Sinityn, Andrei (Institute for the History of Material Culture, Russian Academy of Sciences)

Presentation Format: Oral

Layer II of the Upper Palaeolithic site of Kostenki 14 (Markina Gora) (Voronezh Oblast) has yielded an assemblage attributable to the Gorodtsovian culture – an archaeological culture with without analogy in Central and Western Europe. Radiocarbon dates of $28,580 \pm 420$ BP (OxA-4115) and $29,240 \pm 330/320$ BP (GrA-13312) indicate an age for the layer of 33-34,000 cal BP. The layer's lithic assemblage is characterized by "archaic" components (side-scrapers, points similar to Mousterian types) with the application of developed techniques to work bone, antler and ivory for tools, decorated items and personal ornaments. During the 2014 field season a concentration of non-lithic finds was identified in direct superposition: a piece of pure red ochre on a horse mandible, in association with an antler percussor. The percussor was made from the basal part of a reindeer antler. It possesses two zones of use-wear: on the basal part the rough surface forms a bevel, and on the lateral surface impact marks form a slight rounded pit. The working surface on the basal part was intensively coloured with ochre. Given its archaeological context, this artefact is interpreted as a pestle used for pounding pigment. At the same time, traces of use (impact-marks, striations) and their location are consistent with its use as a soft hammer. In this presentation we discuss use-wear analyses of the tool and the problem of its functional interpretation. Arguments in favour of both hammer and pestle are forwarded and discussed, as is the possibility of its multifunctional use.

The research supported by RFBR grants №17-06-00319a №17-06-00355a.

Theme: Theories and methods in archaeological sciences

Organisers: Pecci, Alessandra (Universitat de Barcelona) - Lancelotti, Carla (Universitat Pompeu Fabra) - Zurro, Debora (CaSES, IMF-CSIC) - Carrer, Francesco (Newcastle University)

Format: Regular session

People tend to recurrently use specific areas of their landscape or living space, as well as particular artefacts, for specific activities. This enduring use of spaces and materials produces an accumulation of evidences (chemical and/or physical), which represent the result of the activity that produced them. Ethnoarchaeology and experimental archaeology drive the inferential reasoning that creates the model(s) connecting the concentration of particular proxies with a specific activity. We define this/these model(s) as 'anthropic activity marker' (AAM). The possibility to identify, analyse and connect these markers to the original activity is pivotal to our understanding of past human behaviour. An interdisciplinary approach is fundamental for the identification of anthropic markers. In particular, the spatial distribution and variability of the fingerprints taken into account is considered a fundamental part of the definition of AAM.

For this session, we seek contributions that challenge the problem of identifying and interpreting AAM from different points of view and at different scales. Contributions can be related, but not limited to: remote sensing, archaeological prospection, botanic analyses (i.e. phytoliths, starch and pollen), chemical analyses of soils and floors, archaeozoology, microdebitage, micromorphology but also residue analyses from artefacts. Ethnoarchaeological testing and archaeological applications of these methods will be equally considered. We particularly welcome multi-proxy and multi-disciplinary studies that illustrate both case-studies as well as methodological approaches.

ABSTRACTS

01 BEHAVIORAL GEOARCHAEOLOGY AND HISTORIC LAND USE IN ANTIGUA, WEST INDIES

Author(s): Tricarico, Anthony - Wells, E. Christian (Department of Anthropology, University of South Florida)

Presentation Format: Oral

Hurricanes Irma and Maria have recently demonstrated once again the susceptibility of contemporary populations across the Caribbean to climate-driven events. For islands such as Antigua in the eastern Caribbean, vulnerability is partly a legacy of prior land use. As such, the actions of pre-Columbian and historic period inhabitants are intertwined with contemporary socio-ecological systems. This research analyzes the relationship between two markers of past anthropic activity, soil quality and landscape stability, across three regions (Ayer's Creek Basin, Mercer's Creek Basin, and Indian Creek Basin) in eastern Antigua. This research utilizes historical documents in conjunction with archaeological data and interviews with contemporary Antiguans to examine the degree, extent, and timing of landscape change. Prior archaeological research near Ayer's Creek and Mercer's Creek has revealed a long-term, continuous sequence of occupation dating back 2,000 years suggesting that contemporary environmental health may be the legacy of both past land management practices and the cessation of sugarcane monoculture in 1981. However, it is unknown to what extent historical land use and its interactions with local geology account for these changes. This research integrates Western scientific understandings of soil with local (experiential) soil knowledge, utilizing physical and chemical soil analysis, geomorphological survey, semi-structured interviews, and archival research to inform a behavioral geoarchaeological approach to understanding dynamic, coupled natural-human systems in Antigua.

02 PREHISTORIC PASTORALISM IN HIGH MOUNTAINOUS REGIONS OF THE MONTAFON AND THE SILVRETTA ALPS (AUSTRIA/SWITZERLAND)

Author(s): Kothieringer, Katja (University of Bamberg) - Röpke, Astrid (University of Cologne) - Reitmaier, Thomas (Archaeological Service of the Canton of Grisons) - Krause, Rüdiger (Goethe University, Frankfurt)

Presentation Format: Oral

The beginnings of intensified pastoral activities in the high mountainous landscape of the Alps have recently become a frequently discussed topic throughout various disciplines. In this paper, we present first results of an interdisciplinary, archaeological and geoarchaeological study on prehistoric pastoralism in subalpine and alpine soils in two adjacent study areas, the Montafon (Austria) and the Silvretta Alps (Austria/Switzerland). Building on own previous research in these areas, we assume intensified livestock grazing during the Bronze Age. In order to compare former grazing intensities at different altitudes, we measured total phosphate concentrations in soils along toposequences in the subalpine (~ 1300 - 2300 m a.s.l.) and alpine (above 2300 m a.s.l.) zone. Most soils that were selected for phosphate analysis were radiocarbon dated by charcoal fragments or charcoal layers. Additionally, we measured pedogenic iron and organic carbon to assess the stability of phosphate during soil formation processes.

So far, our results indicate that the uppermost topsoil is clearly influenced by recent livestock grazing. As a reference, abandoned or less-used pasture-areas show lower phosphate values. In the subalpine region of Urschai valley (Silvretta), slightly increased phosphate concentrations in a Mesolithic soil profile probably reflect past, subtle grazing of wild animals. Maximum phosphate values were evidenced in a Bronze to Iron Age enclosure in Fimba valley (Silvretta). At Bartolomäberg (Montafon), phosphate concentrations measured in different colluvial layers indicate enhanced grazing intensities during the Bronze Age. It becomes apparent that former

pasture areas can be distinguished in an intensely-used, higher subalpine region (above 2000 m a.s.l.) and a less-used, lower subalpine region. Our previous results will be complemented by micromorphological investigations.

03 CATTLE AS ACTORS IN A PASTORAL LANDSCAPE. GIS ANALYSIS OF AN AGRO-PASTORALIST GROUP

Author(s): Salazar-Bonet, Juan (Florida State University International Programs Valencia) - Diez-Castillo, Agustín (Universitat de València - Grup Recerca d'Arqueologia del Mediterrani)

Presentation Format: Oral

In the study of pastoral landscapes, ethnoarchaeology can incorporate first-hand information on material features and herding practices and identify the active role of domestic animals in such practices. The Mursi are a present day transhumant agro-pastoralist group, which are specialized in the livestock herding of cattle (*Bos indicus*). This study examines evidence from this animal behaviour and its needs, which allows us to enrich a particular construction of a herding landscape in contemporary SW Ethiopia. Remote sensing techniques are employed to obtain landscape snapshots of the Mursi main pasture area, which are contrasted with fieldwork data. Moreover, recent improvement in digital terrain models permit us to test cattle desire lines with least-cost path (LCP) between settlements and resources, as well as distances from these settlements to various hazards. The context is characterized by high mobility; however, the Mursi settlements and their social reality consider fixed territorial strategic locations around different hydrological catchment areas and optimal pastures. Less detectable variables such as those related to diverse dangers also appear as key elements to understand this landscape. Animals, their short and long-distance movements, and their consequences on people help create an identity for the Mursi main pasture area. Cattle reveal itself as a decisive agent in the construction of both place and landscape, challenging the conception of animals as merely passive actors in domestication processes.

04 FORMATION PROCESSES OF AN AMAZONIAN DARK EARTH: GEOSTATISTICS ANALYSIS AND DATING OF THE IMPACT OF ANTHROPIC ACTIVITIES

Author(s): Alcaina-Mateos, Jonàs - Lancelotti, Carla (CaSEs Research Group; Department of Humanities, Universitat Pompeu Fabra) - Madella, Marco (CaSEs Research Group; Department of Humanities, Universitat Pompeu Fabra; Department of Archaeology and Anthropology, Institució Milà i Fontanals, Spanish National Research Council - IMF-CSIC; Catalan Institution for Research and Advanced Studies - ICREA) - Calegari, Marcia Regina (Department of Geography, Universidade Estadual do Oeste do Paraná) - Coimbra Martins, Gilvan (Embrapa Amazônia Ocidental, Manaus) - Vidal-Torrado, Pablo (Soil Science Department, ESALQ, University of São Paulo) - Teixeira, Wenceslau (Embrapa Solos, Rio de Janeiro)

Presentation Format: Oral

This paper aims at discussing the use of 3D geostatistics to interpret spatio-temporal anthropic features in a very complex stratigraphy. Amazonian Dark Earth (ADE; Terra Preta do Índio) is a type of Anthrosols widely present in the Amazon Basin and it is associated with human pre-Columbian occupations. The anthropic soil horizons have a large stock of organic carbon and are rich in charcoal remains, resulting in a very dark colour and homogenous deposit that can hamper the identification of stratigraphically well-defined layers. Therefore, the excavations of ADEs often are carried out by artificial spits, which increase the uncertainty in attributing artifacts and ecofacts (especially bio-remains) to a specific chronological phase.

In this paper, we present the results of geostatistical analyses from a set of samples from an ADE locate at the Caldeirão Research Station near Manaus in the Central Amazon (Brazil). The site was sampled for soil chemical and physical characterization with a quasi-regular grid of cores sampled at every 50 m and to a depth of 1 m. Samples for analyses originated from sampling every 20 cm the grid's cores. Geochemical analysis, soil pH, total organic matter and pottery weights were measured. Geostatistical interpolations were then implemented using ordinary kriging in three dimensions (x, y, z) and spatial anisotropy to reconstruct the formation processes of this archaeological site as well as to identify areas where anthropic effect was more intense. The results suggested a long sequence of frequentation with two to three foci of human occupations in different periods. The radiocarbon dating of micro-charcoal from the soil was used to chronologically constrain the results from geostatistical analyses and graphical interpretation.

05 BIOFUELS, RESPIRATORY HEALTH AND THE BUILT ENVIRONMENT IN PREHISTORY - MULTIPROXY INVESTIGATIONS AT NEOLITHIC CATALHOYUK, TURKEY

Author(s): Shillito, Lisa-Marie - Mackay, Helen - Namdeo, Anil (Newcastle University) - Haddow, Scott (Bordeaux University)

Presentation Format: Oral

A wide range of materials have been used as fuels in prehistory including animal dung, reeds and agricultural waste products, which were often preferentially selected for particular activities. Çatalhöyük is a UNESCO World Heritage Site, with >1000 years of continuous occupation from the pre-pottery Neolithic to Chalcolithic period (7100 – 5700 BC). This occupation covers the period when pottery was first produced, a key moment reflecting an increasing sophistication in the control and manipulation of fire in human history and is associated with changes in fuel management strategy. Whilst there have been some limited attempts at uniting archaeobotanical and geoarchaeological approaches, this has never been done systematically. This new research brings together these complementary lines of evidence, wood macrocharcoal and ash geochemistry, and also applies a new methodology using organic biomarkers associated with burning.

In addition to understanding fuel resource use, the extended chronology of the archaeological record has the potential to help un-

derstand the long-term relationship between health and the environment. Following archaeological analysis of fuel use, we are applying computational fluid dynamics modelling to Çatalhöyük, to assess how the Neolithic inhabitants were exposed to respiratory pollutants at different scales, and how this varied according to fuel type and location of the fuel burning activity. The Çatalhöyük archive is an opportunity to compare the hypothetical exposure levels generated by air quality and exposure models, with the osteoarchaeological record to investigate the relationship between changes in fuel use strategies and respiratory health of different demographic groups.

06 INSECTS, ECOLOGICAL FOOTPRINTS AND THE SYNANTHROPIC RECORDS

Author(s): Panagiota Kopulu, Eva (School of GeoSciences, University of Edinburgh)

Presentation Format: Oral

Fossil insects are powerful tools for reconstructing past human impact and activities, as different species have different habitat requirements. These range from close attachment to their plant and animal hosts, including humans, to differing thermal envelopments and hence sensitivity to climate change. Local extinctions as a result of landscape clearance, for example the reduction of faunas associated with woodland and the spread of open ground elements, including invasive species, which may have a significant impact on crop and domestic stock productivity. Those species associated with pastoralism differ from the ones associated with arable farming, and fossil assemblages can provide detailed information concerning anthropogenic and synanthropic environments from the intimacy of the monk's cowl to the man-made steppe. Abundance of species associated with open environments and heathlands in addition to these accompanying livestock, species linked with foul environments, storage pests and ectoparasites accompany the introduction of farming in Northern Europe. This paper will discuss and compare ecological footprints of hunter-fisher-gatherers and farmers from an insect point of view, using examples from various periods during the Holocene and different geographic areas. It will provide an overview of insect species associated with the transition from the Mesolithic to the Neolithic and indicators of further change, in terms of urbanisation, trade and the spread of disease and consider differences in biodiversity in relation to synanthropic activities and thresholds of change.

07 SIT DOWN BY THE FIRE AND WATCH THE LAKE – PRELIMINARY PALYNOLOGICAL INVESTIGATIONS NEAR LATEGLACIAL HUNTER-GATHERER SITES

Author(s): Krüger, Sascha (ZBSA; Kiel University)

Presentation Format: Oral

Geological surveys in the area of a former meltwater lake near Itzstedt (Schleswig-Holstein/ Germany) unearthed undisturbed Lateglacial sediments. A 16 m long overlapping sediment sequence recovered from this area yielded annually laminated Lateglacial depositions. Preliminary investigations of the lowermost four meters allowed for constructing a basic chronological frame. This frame spans the end of the Pleniglacial, the whole Lateglacial and the early Holocene. A sequence of one meter length appears varved and reflects stable deposition conditions during the Allerød period. Preservation conditions for organic material (e.g. botanical macro remains, pollen and spores) are extraordinary.

Moreover, the spatial proximity to Final Palaeolithic archaeological sites (Ahrensburgian and Hamburgian) possibly enables the identification of anthropogenic signals in the record suggesting human occupation phases along the littoral zone. Hence, a palynological investigation is going to be performed on high-resolution level as part of a PhD-project in the frame of the CRC 1266 "Scales of Transformation" at Kiel University and the Centre for Baltic and Scandinavian Archaeology in Schleswig. The investigation aims at a better understanding of human-environment interactions, resource supply and exploitation strategies during the Lateglacial in the area of modern Schleswig-Holstein. To approach this aim, the focus was set on micro-charcoal as a possible human indicator, as well as on coprophilous ascomycetes and other NPPs.

08 EXPERIMENTAL ARCHAEOLOGY IN ENOLOGICAL PALYNOLOGY

Author(s): Tsai, Grace (Texas A&M University; Institute of Nautical Archaeology) - Dozier, Crystal (Texas A&M University)

Presentation Format: Oral

Identification of grape wine production (enology) in the archaeological record has blossomed in the last 20 years, but palynological studies using historical winemaking processes are still lacking. In this project, a seventeenth-century wine recipe was recreated fully—from gathering the grapes by hand, to spontaneous fermentation, to storing the wine in an oak barrel—and its pollen profile characterized. Pollen traps were also placed in the vineyard from which the grapes were collected, and the vineyard's sediment samples gathered, for pollen processing and analysis. This study compares the pollen profile from the wine, to the airborne and vineyard sediment pollen profiles. The goal is to understand the distribution of pollen in such samples, and what can be expected in an archaeological context in vineyards and containers suspected to contain wine. Ancient wine palynology can reveal networks of trade and local environmental conditions, and this research can help tease out pure wine profiles versus ancient wine sweetened with pollen-rich honey or other additives. Identification of activity areas through palynological remains in sediments should also consider cultivated fields such as vineyards. Comparison in the distribution of *Vitis* (grape) pollen in a modern, but traditional, context set archaeological expectations for identification of enological processes in the past.

09 TRACKING SMELTING ACTIVITIES USING SOIL SAMPLES—A GEOCHEMICAL CHARACTERIZATION OF THE ANCIENT MAGAZZINI SITE (ELBA ISLAND, ITALY)

Author(s): Becker, Fabian (Freie Universität Berlin / Physical Geography; Cluster of Excellence Topoi) - Eser, Raphael A. (Humboldt-Universität zu Berlin / Winckelmann-Institute; Cluster of Excellence Topoi) - Hoelzmann, Philipp - Schütt, Brigitta (Freie Universität Berlin / Physical Geography; Cluster of Excellence Topoi)

Presentation Format: Oral

The accumulation of primary and secondary raw materials and the deposition of by-products at a specific location is an integral part of the production chain of pre-industrial iron smelting. This holds especially true for bloomeries on Elba Island (Tuscany), where pre-industrial smelting sites are found in remote locations, far away from ore deposits. Ancient texts refer to mining, smelting, and the transport of ore; the Greek name of Elba, Aitháleia ('the smoky'), and the construction of luxurious villas for recreational issues after the peak of iron production point indirectly to soot emission. The elemental signature of mining and soot emission has been identified in sediment archives, but on-site markers for smelting activities are missing.

Using a multi-proxy and multi-method approach we were able to identify material fluxes and processes in the soil archives of the Magazzini site (3rd–1st century BCE). PCA, cluster analysis, and inference statistics applied to the chemical composition (ex-situ portable XRF) of soil samples gave results that match the spatial distribution of metallurgical macro-remains obtained by an archaeological survey. The analysis of the <2mm sieve-separate allows to identify markers that are macroscopically not visible. Increased (black) carbon contents indicate the deposition of charcoal remains; we interpret low inorganic carbon contents in combination with elevated Ca contents (quicklime) and higher soil pH on the site as a proxy for ash deposition. The spatial variability in the distribution of Cu/As and Fe/magnetic susceptibility may allow for a differentiation between working areas, i.e. smelting and the crushing of raw ore; the elements show a different partitioning behaviour during reduction. A comparison of our results with published elemental compositions of metallurgical remains (i.e. ore and slag) from Elba and the soils and sediments of the local Rio mine clearly shows that smelting sites have their own characteristic signature.

10 MODELLING ANTHROPIC USE OF DOMESTIC SPACES

Author(s): Lancelotti, Carla - Alcaina-Mateos, Jonás (CaSEs Research Group; Department of Humanities; Universitat Pompeu Fabra)

Presentation Format: Oral

Research on archaeological domestic spaces and activities has traditionally been centred on the study of the dispersion of artefacts and their relation with identified structures. In recent years the analysis of microscopic proxies, such as residues (proteins, fatty acids and phosphates), archaeobotanical micro-remains (phytoliths and starch) and multi-element chemical signatures have demonstrated high potential in the identification of domestic anthropic activities. Within this framework, statistical and modelling approaches play a fundamental role for the answering of archaeological questions and have become central in this line of research.

In this paper we present different archaeological and ethnoarchaeological case studies where physico-chemical analyses have been performed on domestic contexts. We concentrate both on the methodological aspects of geostatistical modelling as well as on the identification of specific anthropic activities and identification of activity areas. We demonstrate how an accurate modelling of a domestic ethnographic space of traditional agro-pastoral communities in Gujarat (India) can help us analyse and interpret domestic spaces of a classic Greek house at Olynthos (Greece). This contributes the main scope of this paper, which is to show how the application of geostatistical and mathematical modelling techniques to ethnographic contexts can transcend the limitation of the specific study-case and contribute to build knowledge that can be applied to different chrono-geographical contexts.

11 AN EXPERIMENTAL ETHNOARCHAEOLOGY APPROACH TO PRODUCTION AND CONSUMPTION ACTIVITY MARKERS IN A HUNTER-FISHER-GATHERER SOCIETY OF TIERRA DEL FUEGO, ARGENTINA

Author(s): Garcia-Piquer, Albert (Laboratory of Archaeozoology; Autonomous University of Barcelona) - Lozano, Joan Miquel (Autonomous University of Barcelona) - Solà, Judit - Estévez, Jordi (Laboratory of Archaeozoology; Autonomous University of Barcelona)

Presentation Format: Oral

Comparative studies about the use of space by different ethnographic Hunter-Gatherer societies might allow us to generate hypothesis and build strong interpretative models than can be later applied to the study of the European Upper Palaeolithic and Mesolithic record. We present the results of a research project for the conceptualisation and archaeological testing of production and consumption activities markers using data from Yámana ethno-historical Hunter-Fisher-Gatherer groups (Tierra del Fuego, Argentina).

In this work, ethnographic and archaeological data were combined to propose significant associations between production and consumption activities and the spatial distribution of their waste and debris in Túnel VII and Lanashuaia I, two archaeological sites located at the northern coast of the Beagle Channel. Regarding the archaeological data, different resolutions and several analytical and technical methods were conducted, including the reconstruction of the accumulation history of fine deposition sub-units; 3D modelling; refitting analysis and geostatistical techniques. Moreover, results from archeozoological, malacological and anthracological analysis, use-wear analysis or chemical analysis of the various fireplaces identified were integrated in the intra-site spatial analysis.

The combined use of ethnographic data, technical approaches and heterogeneous archaeological remains provided an opportunity to obtain a high-resolution record of the different human activities carried out in both shell middens. Moreover, results reinforce the assumption that is possible to detect social-division of space in the archaeological record by means of appropriate methodology.

12 COMBINING RESIDUE ANALYSIS OF FLOORS AND CERAMICS FOR THE STUDY OF ACTIVITY AREAS AT THE GARUM SHOP AT POMPEII

Author(s): Pecci, Alessandra (ERAAUB, Departamento de Historia i Arqueologia, Universitat de Barcelona) - Domínguez - Bella, Salvador (Universidad de Cádiz) - Buonincontri, Mauro Paolo (Università di Napoli Federico II) - Miriello, Domenico - De Luca, Raffaella (Università della Calabria) - Di Pasquale, Gaetano (Università di Napoli Federico II) - Cottica, Daniela (Università Ca Foscari, Venezia) - Bernal-Casasola, Dario (Universidad de Cádiz)

Presentation Format: Oral

In this paper we propose the application of the combination of the study of chemical residues in floors and ceramics, with the aim of providing information on the activities carried out in an archaeological building. Floor samples were studied by mean of spot tests developed in Mexico aimed at identifying the presence of phosphates, fatty acids and protein residues, while the organic residues preserved in the ceramic matrix of amphorae, dolia and other ceramic vessels were studied by gas chromatography coupled with mass spectrometry. Moreover we integrated the data obtained with specific studies aimed at better identify the solid residues found inside two of the amphorae studied: botanical studies of fruit stones recovered in a Dressel 20 amphora and the characterization of the lime preserved in an African amphora. All these proxies can be considered anthropic activities markers.

We chose the case study of the Garum Shop at Pompeii to test this methodology, because, due to the peculiarity of this archaeological contexts it provided an ideal case where the activities performed are in part known and the ceramic vessels recovered are still in situ.

The research allowed identifying the traces of some of the activities performed, such as cooking and producing garum in the floors of the building and the use and re-use of amphorae and dolia before the Vesuvian eruption.

13 LOOKING FOR THE WOODEN STRUCTURES OF THE ROMAN FISH SALTING PLANTS AT BAELO CLAUDIA

Author(s): Zurro, Debora (IMF-CSIC; Department of Humanities, University Pompeu Fabra) - Bernal Casasola, Dario (Department of History, Geography and Philosophy, University of Cadiz) - Elvira, Josep (Institute of Earth Sciences Jaume Almera - ICTJA-CSIC)

Presentation Format: Oral

Archaeology is witnessing a strong development of techniques aiming at the understanding of anthropic signatures both at environmental and intra-site levels. We have increased importantly our capability for producing a wider archaeological record. Classical archaeology provides good preservation contexts in which archaeological methodology and techniques can be push forward, allowing to improve reliability and accuracy of materials identification.

Inhabitants settled in the mid 2nd Century BC in the ancient Roman city of Baelo Claudia (Cádiz, south Spain) as a strategic site for fishing and commercial exchange between Europe and Africa, becoming an important city from Augustus onwards, and during Roman & Late Roman times.

In the last five years a Research Project has been developed in the so called industrial quarter, next to the beach, where different Tuna fish-salting plants were built for garum and salsamenta production. Two new cetariae with vats have been unearthed, showing many remains of the halieutic cycle (fishing – fish processing). In the abandonment layers (early V c.A.D.) at the yard of one of the plants a fish dump was found with many faunal remains coming from the tuna cutting process. Between these discarded fish bones many bronze nails were found in a small area of 5 m² circa. The hypothesis is that they could belong either to the furniture (tables) or to the wooden beams in the ceiling used to hang the fishes during the evisceration and the cutting activities, well known by ethnographic parallels.

In this case we apply different techniques aiming at testing this hypothesis; the presence of wood together with fish residues as remains from this working station.

To reach this goal we study this context through archaeobotany (phytolith analyses) together with other techniques (multielement analyses and x-diffraction analysis). Both the case study, methodology and results will be shown.

14 THE SUBSISTENCE ECONOMY OF THE ENEOLITHIC DEREIVKA CULTURE OF THE UKRAINIAN NORTH-PONTIC REGION THROUGH LIPID RESIDUES ANALYSIS OF POTTERY VESSELS

Author(s): Mileto, Slmona (Institut für Prähistorische Archäologie, Freie Universität Berlin; Organic Geochemistry Unit, Biogeochemistry Research Centre, School of Chemistry, University of Bristol) - Kaiser, Elke (Institut für Prähistorische Archäologie, Freie Universität Berlin) - Rassamakin, Yuri (Institute of Archaeology of the National Academy of Sciences, Kiev) - Evershed, Richard P. (Organic Geochemistry Unit, Biogeochemistry Research Centre, School of Chemistry, University of Bristol)

Presentation Format: Oral

The Dereivka site of the North-Pontic forest-steppe has been widely investigated because of its potential as a centre for horse domestication. Despite the significant archaeological evidence available, Dereivka is considered a contradictory site (Rassamakin 1999) due to a range of challenges connected with reconciling the various lines of available archaeological evidence. Consequently, a generally acceptable subsistence economic model has still to be developed, with contrasting theories remaining unresolved.

The molecular and isotopic evidences recoverable from absorbed organic residues preserved in archaeological pottery are proving to be a powerful tool in reconstructing ancient diet (Evershed 2008). Compound-specific stable carbon isotope analysis of pre-

served fatty acids ($\delta^{13}C$ and $\Delta^{13}C$ values) allows the identification of animal fats (e.g. non-ruminant vs ruminant adipose), whereas compound-specific stable hydrogen isotope analysis (δD values) allows resolution of more challenging fats (e.g. equine milk and adipose fat).

In this work, forty potsherds have been submitted to biomolecular and stable isotope analyses and the results are displayed in relation to previously published zooarchaeological evidence (Kaiser 2010). The findings offer a further perspective on the overall subsistence economic strategies of the community, particularly in relation to the exploitation of the horse. Significantly, the biomolecular and stable carbon isotope results confirmed that Dereivka community consumed horse products predominantly, together with smaller proportions of ruminant and non-ruminant products. Interestingly, although ruminant adipose fats were recovered from some vessels, evidence of ruminant dairy product exploitation was insignificant, with only one residue displaying a possible ruminant dairy fat origin. Hydrogen isotope analysis of lipids was applied to investigate equine milk processing in pots (Outram et al. 2009) but these analyses did not offer significant new insights.

Evershed (2008). *Archaeometry* 50:895–924.

Kaiser (2010). *Godišnjak Cent za Balk Ispit* 39 23–34.

Outram et al (2009). *Science* (80) 323:1332–5.

Rassamakin (1999). *Late Prehist Exploit Eurasian steppe* 59–182.

15 BEHAVIOURAL PATTERNS AT YOUR FINGERTIPS: FINGERPRINTS ANALYSIS OF A ROMAN CERAMIC WORKSHOP AS ANTHROPIC ACTIVITY MARKER (LEZOUX FRANCE)

Author(s): Lambert, Aurélie (Eveha; UMR 7268 Ades) - Desmarais, André (UMR 7268 Ades) - Driard, Cyril (Eveha)

Presentation Format: Oral

During the early Roman Empire, Lezoux (Auvergne, France) was an important ceramic production hub in Gaul, across the Roman era. This terra sigillata tableware production is characterised by manufacturer's marked products associated to specific pottery workshops. A recent excavation revealed two workshops and information relating to their owners (Driard et al. 2017). 2523 fingerprinted had been identified on sherds. Among these, 106 fingerprints had been studied using the distribution of epidermal ridge densities to diagnose the crafter's sex and fingerprint's ridge breadth measurements to establish the age of the vessel's crafter. To apprehend the working space of pottery workshop, 74 fingerprints well-preserved had been selected from this sample for the identification issue.

Our purpose is to explore forensic contribution to archaeological research, and also investigate the organisation of ceramic production at Lezoux including ethnographic data through different criterias : individual identification, the gender roles and learning curve at the workshop scale and between workshops.

Concerning the identification, a scientific protocol had been applied to select the marks regarding their conservation, attrition and quality to define a repeatable and reproducible method. Thus, seven fingerprints had been identified and two occur on different find of sherds from distinct waste pits. Each pit seems to belong to a separate workshop, illustrating labour pattern.

Preliminary results indicate that both sexes and subjects of various ages created and finished the vessels. The workshops of Lezoux are part of both a domestic and craft areas. Thus, the craft may be familial, with youngs learning and practicing with their elders.

Future perspectives will include data integration from other excavations from Lezoux as well as more experimental data from actual craft specialists concerning gestures. Our novel multi-disciplinary investigation had shed light on the how of specific activities and workspaces, using original data.

16 THE RELEVANCE OF BASIC SCIENCE TO STONE TOOL USE AND MEAT-EATING: STANDARDISATION OF BONE SURFACE MODIFICATION METHODS AND INTERPRETATIONS

Author(s): James, Emma (The University of Queensland)

Presentation Format: Oral

Modifications to the surfaces of fossil bones are one of the most important lines of evidence for understanding different issues in palaeoanthropological, archaeological, and taphonomic research. Bone surface modifications (BSM) are used to infer past lifeways and behaviours through site formation processes, subsistence patterns and adaptations and how they influenced human evolution, as well as patterns of economic and social evolutions. By identifying BSM from ethnographic studies of BSM created by people in the present day and comparing them to marks found in the archaeological record, archaeologists have been able to tie traces to specific bone modifying actions. However, traces left by non-human modifiers can mimic those produced by humans. Experimental taphonomic studies in zooarchaeology have been largely conducted with the goal of confidently tying traces to known actors and effectors. However, variation in experimental design, experimental bone subjects, and how the resultant BSM are classified and analysed has contributed to a lack of consensus between researchers. Furthermore, debates based on BSM interpretations illustrate the lack of consensus amongst researchers about how to best identify and differentiate anthropogenic from non-anthropogenic modifications on bones. In the context of the origins of tool-assisted butchery, having a robust method to identify these traces is a foremost concern for understanding our own evolution. Resolving this issue requires two things: 1) a large dataset in which marks on bones have been produced experimentally under highly controlled conditions; and 2) a replicable method for quantitatively ana-

lysing and describing traces on bone surfaces. This research provides impetus for the standardisation of bone surface modification studies, specifically the experimental and analytical methods, as well as how researchers identify and classify modifications and, subsequently, communicate their results and interpretations.

17 PERFORATED LAND SNAILS SHELLS IN WESTERN MEDITERRANEAN DURING LATE PLEISTOCENE-EARLY HOLOCENE : PRELIMINARY STUDY

Author(s): Saafi, Ismail - Verdun-Castello, Ester (LAMPEA, UMR CNRS 7269, Aix-Marseille University) - Hutterer, Rainer (Department of Vertebrates, Zoologisches Forschungsmuseum Alexander Koenig) - Beyreis, Sylvie (CEPAM, UMR CNRS 7265 – Université Nice Côte d'Azur) - Casabó i Bernad, Josep (Conselleria d'Educació, Investigació, Cultura i Esport. Direcció Territorial de Castelló) - Aouadi, Nabiha (Musée du Bardo, Institut National du Patrimoine) - Merzoug, Souhila (Centre National de Recherches Préhistoriques, Anthropologiques et Historiques - CNRPAH) - Belhouchet, Lotfi (Musée Archéologique de Sousse, Institut National du Patrimoine) - Linstdatter, Jörg (Deutsches Archäologisches Institut) - Petruzzo, Giacomina (ArScAn, UMR CNRS 7041, Université Paris Ouest Nanterre La Défense)

Presentation Format: Oral

Since the beginning of the 20th century, certain works (e.g. Debruge and Mercier, 1912, Debruge, 1910) have mentioned the presence of terrestrial snail shells pierced in archaeological sites of eastern Algeria. These sites are locally called “rammadiyat” (or “escargotières”). After about a century, new studies are interested in this phenomenon (Hutterer et al., 2011, 2014, Saafi et al., Submitted). Although the appearance of perforated gastropod has been identified since the Aurignacian (in the Iberian Peninsula), and the Iberomaurusian (in North Africa), they are more abundant in recent periods (Mesolithic / Capsian).

In the North African sites the percentage of pierced shells does not exceed 20% of the malacological assemblage at each site. Generally, the perforations are similar in shape, size and position. However, thanks to an ethnographic study, an experimentation program and a traceological analysis some differences can be highlighted and we have been able to identify the techniques used to make the perforations and their function. Some of the perforations were made pierced by human canine teeth or by a cutting tool (blades or slats for example). In most of the cases when the perforations are located in the upper part of the spire they are used to facilitate the extraction of the animal from its shell when the latter resists in the upper part of the shell. The perforations at the last body whorl (behind the peristome) are fewer. They are related to the production of ornaments (necklaces) and, up to now, they are only present on the Maghreb. This is an example of the new role of continental malacofauna in the daily life of human groups. Moreover, due to the limited presence at a few sites, these perforated terrestrial snail shells are considered to be markers of the mobility of human groups in the western Mediterranean.

a. IDENTIFYING CASTING ACTIVITIES: A COMPARISON OF ARCHAEOLOGICAL AND EXPERIMENTAL SEDIMENTARY RECORD

Author(s): Armigliato, Alessandro (University of Bologna) - Peinetti, Alessandro (Université Paul Valéry Montpellier; University of Bologna)

Presentation Format: Poster

In the Terramare culture, one of the most important culture in the Northern Italy during the Middle and Late bronze age (1650-1150 a. C.), there are very few evidences of casting activities if compared to the great amount of objects found. Among scholars one of the possible reason is the difficulty of detecting them during the fieldwork. In fact, only evidences of prills, slags, and technical ceramics allow to define an area as metallurgical but these residues are easily removable from the activity areas (both because the metal could be remelted and because the area needed to be cleaned before a reuse). This preliminary study tries to compare macro-artefacts, micro-artefacts and the sedimentary record from two experimental casting pits and from an archaeological context (Solarolo, Ravenna, Italy). Macro-residues were collected both in archaeological and experimental contexts and will be compared from a morphological and genetic point of view. In addition, several samples of loose sediment were collected during the archaeological excavation trying to provide a microarchaeological analysis to typify the archaeological assemblages related to casting activities. The archaeological excavation was conducted with a geoarchaeological approach to stratigraphy. Sedimentary markers related to casting activities, the frequentation and the maintenance of the activity area were described at a macroscopic scale. Samples for soil micromorphology and geochemistry were systematically collected for further analysis, to characterize the formation processes related to casting activities, both spatially and diachronically. Furthermore, metal residues (prills and slags) will be submitted to an in depth morphological investigation and compared to the experimental ones in order to obtain useful data for the reconstruction of the metallurgical processes. On the long term this interdisciplinary approach of experimental archaeology and soil micromorphology might help to a better understanding of the human past activities.

442 PAN-DISCIPLINARY RESEARCH AND THE FUTURE ROLE FOR ARCHAEOLOGY

Theme: Theories and methods in archaeological sciences

Organisers: Damm, Charlotte (Arctic University of Norway) - Burström, Mats (University of Stockholm)

Format: Discussion session

This session is organized in celebration of the 50th anniversary of the journal *Norwegian Archaeological Review* (1968-2018). The journal has played a significant role in promoting new theoretical and methodological perspectives, and this is followed up here with a debate directed at the future for archaeology. The session will play upon the discussion format of the journal with two short formal introductions and a few invited discussants in addition to the open discussion.

Archaeology has a long and strong tradition for interdisciplinary research, with natural sciences, humanities and social sciences. But what are archaeology's main contributions to the pan-disciplinary research environment?

Archaeology has produced end-results in the form of diachronic narratives of change and resilience, and details of major events, everyday life and individual life histories. It addresses the materiality of life, and the role of cultural heritage, and is increasingly concerned with past and present perception. Archaeology contributes to the critical evaluation of research as a situated practice, where both themes and approaches show great diversity.

In this round table discussion a key theme is the strengths deriving from archaeological perspectives. We will discuss the contributions these deliver both to current research themes such as the Anthropocene, climate change and migrations, and to more existential issues, such as the understanding of what constitutes the past, the interaction with nonhumans, and the fundamental presence of the material. An integral part of this discussion are reflections as to what constitutes archaeological practice and knowledge. What is archaeology?

The current research climate strongly encourages inter-disciplinary collaboration, with possible effect on the balance between disciplines. In such a setting the current and traditional disciplines and University faculties may be anachronistic, presenting obstacles for the development of new knowledge and perspectives. Alternative compositions of academic Schools and research groups may steer us in new directions. How do we envision the organization of the knowledge and practices so far associated with the discipline of archaeology in future research and education?

The invited speakers and discussants spring from a variety of different institutions, represent different current perspectives, and will prepare the floor for an open and engaging discussion.

The two confirmed introductory speakers are:

Dr. Alfredo González-Ruibal, Institute of Heritage Sciences (Incipit), Spanish National Research Council (CSIC)

Prof. Rane Willerslev, Director of the National Museum, Denmark

ABSTRACTS

01 BEYOND THE ANTHROPOCENE: AN ARCHAEOLOGY OF THE CONTEMPORARY WORLD

Author(s): González-Ruibal, Alfredo (Incipit-CSIC)

Presentation Format: Oral

The Anthropocene has become one of the key topics in the humanities and the social sciences during the last few years, to the point that some now talk of a "geological turn". Historians, archaeologists and even philosophers have started to use the language of the natural sciences to make sense of the contemporary world. Archaeologists, too, have been actively engaged in the debate for a while, as seen in the pages of *Norwegian Archaeological Review* (Solli et al 2011). In this paper, I argue that by putting too much emphasis on phenomena that occur on a geological scale (climate change, hyperobjects), we might be losing sight of other issues that are key in defining the contemporary world and its problems. I defend that archaeology should follow the material traces of these other phenomena so as to explore, on the one hand, local effects of global change, and on the other, the political economy that lies behind the Anthropocene, including patriarchy, predatory capitalism and coloniality. Instead of adopting wholesale the eras defined by other disciplines, it is suggested here that archaeologists define their own periods based on material phenomena, not all of which have geological relevance. In this way, the discipline may have its own say in debates that are of relevance beyond the discipline and beyond the realm of science altogether.

02 ARCHAEOLOGY AND THE FORENSIC TURN IN THE HUMANITIES

Author(s): Domanska, Ewa (Department of History, Adam Mickiewicz University in Poznan)

Presentation Format: Oral

The talk will present a shift in the necropolitics as well as in collective memories (and in the humanities) from the testimonial paradigm to the paradigm of material evidence. This shift often labelled as the "forensic turn" in genocide studies manifests itself in the "exhumation movement" that has appeared in Europe (also in Poland and in Spain) and a number of Latin American countries. The nationalization and politicization of exhumations, the criminological interpretation of remains and a privilege given by the state's necropolitical practices to the remains and artifacts in comparison to testimonies gathered from living human witnesses might be politically and ethically ambiguous. However, from theoretical point of view the "forensic turn" stimulates development of new approaches, perspectives and methods. Thus, the new context of debates about anthropocene, forensics, non-anthropocentrism, new materialism and new vitalism, relational epistemology and ontology, etc., stimulates a dynamic growth of (and changes in) various subfields of archaeology such as for example: environmental archaeology, forensic archaeology, multispecies archaeology, and a growing interest in cooperation between archaeology and law as well as with soil science and forensic sciences. How the "forensic turn" influences changes in archaeology as a discipline as well as in the humanities in general by introducing such fields of research

as the environmental history of the grave, prehuman genocide or virtual taphonomy? What are the advantages and disadvantages of this turn for the future of archaeology (and the humanities)?

03 TRANSDISCIPLINARY ARCHAEOLOGY AND THE FUTURE OF ARCHAEOLOGICAL PRACTICE: PORTABLE SCIENCE, CITIZEN SCIENCE, ETHICAL SCIENCE

Author(s): Milek, Karen (Department of Archaeology, Durham University)

Presentation Format: Oral

There is no question that archaeology makes significant contributions to the understanding of long-term social narratives, identities, and human-environment interactions. However, publicly funded archaeology also faces a challenge: it is being asked to become more directly relevant to the big political issues that face societies today, such as how to manage environmental change, food security, sustainable exploitation of resources (especially sources of energy), mass population movements, racism, terrorism, and threats to lives, livelihoods, buildings, and heritage assets in conflict zones. Some archaeologists have already suggested that we have an ethical imperative to contribute to these important political agendas. At the same time, national archaeology strategy documents and the importance that governments place on the societal impacts of university research indicate that archaeology should be for everyone. But is it currently? If not (yet), how can this be achieved? From the point of view of archaeological science, I will highlight the key role that archaeology can potentially play in politically important transdisciplinary research agendas – and some cases in which it already is. I will discuss some of the research strategies and tools that are available to help us, including technology-enabled citizen science, as well as some of the innovations that still need to be developed if archaeology is to increase its social and political relevance into the future.

04 TOWARD A PROBLEMATIZING, INTELLECTUAL, AND TRANS-DISCIPLINARY ARCHAEOLOGY

Author(s): Nilsson Stutz, Liv (Department of Anthropology, Emory University; Linnaeus University)

Presentation Format: Oral

Archaeology is ideally situated to lead debates about cultural heritage, identity politics, migration, and cultural change - all central themes for some of the most urgent intellectual and political debates in contemporary Europe. So far, archaeology has had little to say in terms of public intellectual discourse on these matters. This is particularly enigmatic since archaeology consistently is being used by political interests, often to make nationalist and xenophobic claims. This contribution seeks to problematize this situation and propose a way forward.

Two powerful phenomena are currently framing archaeology: The first is our successful brand among the public as specialists of the past, not the present. This holds us back from taking a central role in contemporary debate. The second is the dynamic between the “new scientific revolution,” the media, and the public. The return of empirical evidence and natural science based hypothesis driven research has in many ways been extremely beneficial for the discipline, and has provided essential anchoring of our interpretations in the archaeological record. At the same time, the paradigm has tended to drown out the archaeology that seeks to understand the past from a more humanities based perspective. This is visible in the research grant politics (the big money game), in the citation index driven publication culture (which drives professional promotions), and in how these highly publicized results are communicated to the public through media where simplified “truths” are provided and consumed.

As archaeologists, the future of our discipline is in our hands. We can change the game by driving a collaborative transdisciplinary archaeology that truly integrates multiple perspectives to understand the past, and that insists on problematizing it – and our contemporary world, not simplify it. And to do so publicly.

05 BECOMING ARCHAEOLOGICAL: WHICH SIZE OF BRUSH?

Author(s): Tringham, Ruth (Dept. of Anthropology, Univ. of California)

Presentation Format: Oral

As archaeologists we make a significant contribution through lessons learned from the laws of entropy over the long multidimensional trajectory of human (and non-human and earth life) history - death, decay, fragmentation - the process of becoming archaeological. An equal contribution to knowledge should be the lessons learned about the intangible collaterals of entropy - events, memories, stories, movement - and their entanglement with physical processes and occasional reversal of the processes through survival, resilience, and continuity.

I will respond to themes addressed by the two speakers. But in doing so, I will draw attention in the discussion to an aspect that I believe is applicable to any theme of archaeology's role, whatever the standpoint of the archaeologist: how do we as recorders and disseminators of lessons learned about the past narrate the lessons learned, how do we incorporate the intangibles with the tangibles of becoming archaeological without losing academic credibility, scientific legitimacy, or a richly complex multisensorial story? Currently, most lessons that archaeologists offer to their peers and the public are written with a very large brush on a continental or at best regional scale: migrations and mobility, climate change, social networks. My standpoint is one that advocates starting with a much finer brush, applying Rosemary Joyce's (2002) exploratory chronotope. At such a scale of resolution, the wonders of Big Data and DNA are not denied, but are employed in the creation of richer, more complex ways to learn the lessons, that make room for the ambiguity and imagination that is required by the application of things archaeological. Working from such a scale outward will not

provide the definitive answers that we all crave, but it will make transparent how we have reached a conclusion - learned the lesson - and how it can be debated and modified.

06 **ARCHAEOLOGY AND THE PAN-DISCIPLINARY FUTURE: AT THE CROSSROADS OF METHOD AND THEORY**

Author(s): Damm, Charlotte (Dpt of Archaeology and Social Anthropology, Arctic University of Norway)

Presentation Format: Oral

Archaeology is a broad field that engages with a wide range of both methods and theories. At present we see tremendous interest in aDNA and isotope analyses, in the potential of digitalisation and Big Data, and in materiality in a wide sense. Does the increasing interaction with – and some would say dependence on – methods and perspectives developed in other disciplines present a risk that archaeology as a subject will be less prominent? Or are archaeologists in fact better equipped than most scholars to deal with a pan-disciplinary future? More than many other traditional disciplines archaeology is a very varied field, which requires competence practically, methodologically and theoretically. Will archaeology be the discipline most capable of responding to an interdisciplinary future? The latter will be argued here: archaeologists are well equipped to meet a future where disciplines may become less distinct. However, we may see increasing diversity in research topics and approaches between institutions and educational programmes, with more emphasis on specific research and teaching specialities, a trend already well on the way. As a result it may present a significant challenge to be able to provide a new generation of students with the same diversity in basic skills and knowledge. A fragmentation of the existing broad skills and knowledge that characterise archaeologists would be unfortunate.

449 **TEMPORALITY AND RELATIONALITY IN PLACE-MAKING**

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Eriksen, Marianne Hem (University of Oslo; University of Cambridge) - Lund, Julie (University of Oslo) - Kay, Kevin (University of Cambridge)

Format: Regular session

This session will examine temporality in the process of place-making by exploring the affective and relational bases for the continuity and reuse of places. Place continuity has often been approached as a sociopolitical strategy: the past, in the past, could serve to legitimate or contest claims to authority and ownership. Less explored have been the ways in which places, as immersive assemblages, constitute the affective and social milieu in which political claims alongside other kinds of action are constructed. Places with great time-depth may have affected inhabitants and visitors with notions of continuity, ancestry, sense of belonging, or else anxiety, awe, or subordination. Long-term accumulation of visible and non-visible structures, whether settlements, burials, urban centres or monuments, may furthermore orient actions and dispositions by providing a sense of place and place-in-time.

In essence, the saliency of place is a question of relationality across time. Therefore, papers from any period or geographical region that examine the emerging relationships among places and people, materials, and animals, are welcome. Papers examining the emotional experience of temporality in relation to place, and the effects and affects of deep time as part of place-making, are also warmly invited.

ABSTRACTS

01 **MAKING PLACE THROUGH THE ACCUMULATING TIME AND THE CREATION OF RELATIONS TO THE PAST IN VIKING AGE SCANDINAVIA**

Author(s): Lund, Julie (Department of Archaeology, Conservation and History)

Presentation Format: Oral

This paper will explore some of the temporal aspects of place-making in the Viking Age. An analysis of the use of kerbstones on burial mounds in the Viking Age is presented. These burial sites from present-day Eastern Norway include locations with varying temporalities, from burial sites with short term use to large cemeteries which were in use for more than a millennium and different strategies in terms of reuse of burial mounds and reinvention of mound traditions. Through this analysis, the paper will focus on the relational aspect of links created to the past in the Viking Age. As the use of the past more than anything has been studied in relation to questions of ownership and legitimation of power structures, the study of the kerbstones and of the role of monumentality in Viking Age Scandinavia more generally opens up for a critical assessment of the changing concepts of power in the archaeological research. Further, the use of the past as part of place-making in Viking Age Scandinavia is explored in relation to questions of self-perception in Viking Age ontology. More overall, the ambition is to nuance the differences between continuity versus reuse, long durée versus reinvention, and memory versus commemoration in studies of place-making.

02 ALL THAT REMAINS: TEMPO(RALITIES) AND MEMORIES OF THE DEAD IN LATE NEOLITHIC MALTA

Author(s): Thompson, Jess (University of Cambridge) - McLaughlin, Rowan (Queen's University Belfast)

Presentation Format: Oral

The late Neolithic period on the Maltese islands, from 4200-2300 BC, was a time of intensified activity debated variously as the result of increased insularity (Stoddart et al. 1993) or the deliberate construction of a local island identity (Robb 2001). This island identity took the form of large megalithic monuments, distinctive ceramic and figurine styles, and elaborate burial hypogea. As the most recently excavated of these hypogea, the Xaghra Circle on Gozo is an ideal site through which to explore the relationship between temporality and place-making in this environment. For more than 1000 years, remains of the dead were deposited at the Xaghra Circle and subjected to prolonged post-depositional interactions. Recent taphonomic analysis and radiocarbon dating of the human remains has substantially refined our understanding of these practices. As complementary analytical methods, Bayesian analysis paints a broad picture of the temporality of interactions with the dead, while taphonomy reveals the finer details. Modelling the intensity of burial activity, peaks and troughs – the tempo – of these interactions, are made visible. This tempo reveals three main phases of interest: an initial small-scale use of the site, and a later intense period of funerary activity, which bracket 200-400 years of temporary dis-use. The affective capacity of ancestral remains likely differed significantly throughout each of these phases, eliciting changing relationships between the living and the dead. Equally significant to place-making at the Xaghra Circle, then, was both temporary abandonment and prolonged periods of repetitive funerary practices. Attending to this tempo through a multi-scalar approach, we suggest that relations with the past were enacted for diverse reasons throughout the late Neolithic in Malta.

03 FRAGMENTED BELONGINGS: MATERIAL CULTURE AND PLACE-MAKING IN BRONZE AGE CRETE

Author(s): Relaki, Maria (Université catholique de Louvain) - Tsoraki, Christina (University of Cambridge)

Presentation Format: Oral

Bronze Age Cretan cemeteries are well known monuments of continuity, having been used for centuries for the burial of successive generations of people. This long-term investment has understandably singled them out as sites of diachronic belonging and active agents in community building. What is lesser known, largely due to the lack of excavated settlements, is how this belonging materialised at the intersection between the dead and the living. The recent excavations of a large House Tomb cemetery at the site of Kephala Petras, in East Crete, at the immediate vicinity of the settlement provide an exciting opportunity to explore more sophisticated temporalities of place-making than simply diachronic continuities in spatial investment. An ongoing study of material culture from both sites has underlined material and temporal fragmentation as a key characteristic in creating a sense of place at Petras. Objects are intentionally fragmented and scattered not only across the cemetery, but also along the neighbouring settlement creating intricate patterns of spatial and temporal belonging: e.g. half a stone vase is buried at the cemetery while the rest of it continues 'living' in the settlement. Such dispersal blurs the boundaries between the places of the living and the dead, while practices of curating heirlooms through time, producing 'archaic' styles of material culture, and emulating 'exotic' objects also combine to create immersive assemblages of humans and things that reproduce very complex spatial and temporal understandings of place-making and belonging.

04 TIME AND TERRITORY: NON-LINEAR TEMPORAL DYNAMICS OF EARLY LAND CONFISCATION PROCESSES IN SOUTHERN SCANDINAVIA

Author(s): Løvschal, Mette (Aarhus University)

Presentation Format: Oral

During the Bronze Age, the physical manifestation of land tenure boundaries (Celtic fields) made a fundamental temporal and spatial reconfiguration of the landscapes across large parts of northern Europe. Thousands of hectares became enclosed by very similar looking parcel-shaped enclosures, still visible today as earthen and stone banks. The boundaries represented new ways of territorialising time and space; they enabled keeping particular plots, planning the alternating rhythms between fallow and cultivation, and they became enduring, visible features in the landscape which constantly confronted people with generations to come.

However, little attention has been dedicated to their temporal genesis, including when these boundaries were created in the first place, how fast land confiscation processes took place, the long-term accumulation of field boundaries, as well as how the evolution of permanently enclosed landscapes promoted particular perceptions of time and place. Instead, Bronze Age land tenure boundaries have frequently been encountered in a rather ahistorical perspective, dominated by horizontal snap-shots rather than vertical time-sections. This paper presents the preliminary results of the last five years of field work targeting the temporal dynamics of Bronze Age land tenure systems in southern Scandinavia. It uses the new chronologies based on ¹⁴C and OSL dates of banks and lynchets to explore the relationship between duration and entropy in land tenure boundaries as well as ways in which non-linear time dynamics are embedded in enclosed field systems on multiple scales. Moreover, modern day land confiscation processes are brought forward to discuss the possible pace of large-scale landscape enclosure in late prehistoric times.

05 'NATURAL' PLACES OR THE DEEP PAST? A SENSE OF PLACE AT NEOLITHIC MONUMENT COMPLEXES IN THE BRITISH ISLES

Author(s): Greaney, Susan (English Heritage/ Cardiff University)

Presentation Format: Oral

There are countless examples in ethnographic studies of communities from all across the world that regard particular places in the landscape as powerful or sacred; natural features that were or are perceived as active, alive and having a deep past in myths and stories (Carmichael et al. 1994 Hirsch and O'Hanlon 1995, Feld and Basson 1996; Eck 2012). These hierophanies, as defined by Mircea Eliade (1954) can include sinkholes, caves, mountain tops, river junctions, springs or unusually shaped rocks or outcrops. Largely drawing on examples from the Neolithic of the southern British Isles, this paper will argue that there is a significant relationship between these 'natural' significant places and the emergence of clusters of monuments. It is unlikely that Neolithic people saw these active or unusual places as entirely natural, but may have perceived them culturally as evidence of the past activities of real ancestors or mythical beings. By adopting a relational and materialist approach, and by setting aside the western modern division between nature and culture, the paper will explore how these places might have influenced the emergence of Neolithic monument complexes through the selection of locations, the emulation of natural features and the incorporation of materials into their construction. As monuments and activities began to accumulate over time at these locations, they altered and changed the landscape for subsequent building projects and engagements; people continued to build on a sense of place and the physical remnants of the deep past to create powerful places.

06 THE VIKING LANDSCAPE(S): LAND TRANSFORMATIONS & ENVIRONMENTAL BEHAVIOUR IN THE NORTH ATLANTIC

Author(s): Knutson, Sara (University of California, Berkeley)

Presentation Format: Oral

This paper considers Scandinavian diasporic settlement in the North Atlantic during the Viking Age as an ontological phenomenon and investigates the impacts of the Scandinavian world-view and ways of "being" on the physical landscape. The Scandinavian colonization of pre-existing Pictish landscapes in the eastern Scottish Isles offers an intriguing case study on the emergence of relational places from a plurality of cultural landscapes. The Scandinavians' reuse of the land from their Pictish predecessors, each with incompatible ontologies of 'place,' ecological balance, and environmental behaviour, posed immediate challenges to the incomers and produced long-lasting effects on the land. I will examine settlement remains and paleoenvironmental data from two distinct North Atlantic environments, Shetland and Orkney, on which the Viking settlers developed culture-specific agricultural regimes. For over the course of the long Viking-Age, the Scandinavians maintained a particular conception of agricultural 'place' and prescribed particular behaviours for human interaction with such spaces, despite their long-term unsustainability from an ecological standpoint. This work seeks to detangle the complex historical relationship between humans and environmental materials and forces, revealing the tension between cultural continuity and discontinuity of place and landscape. I will finally question how such human- nonhuman interactions can assemble in order to lead to visible ecological shifts and the reconstruction of the ontology of place.

07 SITE BIOGRAPHY OF SACRED PLACES - MAKING AN ANCIENT SACRED STONE OUT OF NOTHING?

Author(s): Jonuks, Tonno (Estonian Literary Museum)

Presentation Format: Oral

The importance of sacred sites can be observed in many countries across Europe. But the valuing of sacred sites has much longer history, setting the origin of a place on central position. Demonstrating the long history and ancient usage of the site adds credibility and feeling of authenticity even in cases where other data, except the toponym or oral tradition, are missing. One of the most well-known sacred places in Estonia – a large boulder with two symmetrical depressions – is situated in the middle of Tartu town on top of a hill. The documented history of the stone goes back to the mid-19th century but it has been claimed that the offering stone with artificial depressions may reach back to the pre-Christian time, indicating at a major sacred place atop this hill.

By using the site biographic approach I wish to explore the detailed history of this boulder, focusing on the questions of its discovery and documented usage. The location of the site in the middle of the town is the reason for a rich documentary corpus which allows observing in detail how the meaning of this stone has developed during the past couple of centuries. Such a rich documentation allows also to draw broader conclusions for other sacred places, concerning the reasons why and how places are chosen for sacred sites and how folklore associates with these.

08 VIKING AGE RUNESTONE CONTEXTS AND THE RHYTHMS OF MONUMENTALISATION

Author(s): Brunstad, Stine (University of Oslo)

Presentation Format: Oral

When runestones were raised in the proximity of older graves and monuments, it can be considered a strategy for articulating the present with the past and the future; with continuity and memory on one hand, and with change and anticipation on the other. One problem Viking Age people and researchers today have in common is knowing the exact ages of the graves or monuments runestones were raised in association with. Were they using, referencing or activating a recent, genealogical past or a distant, myth-

ical past (Gosden and Lock 1998)?

The juxtaposition of old and new elements in certain places of commemoration can be considered to form parts of multi-temporal assemblages. Thus, the focus on sequences of activities and linear trajectories from the past to the present in approaches to the biographies of places will be seen in the light of revised understandings of stratigraphy and chronology. I will present an analytical tool called the rhythms of monumentalisation, which will be used in order to examine how the use of the past can be more connected to specific periods than others, and to understand the nature of the involvement with older sites in the Viking Age. Consequently, the accumulation of matter in places will be examined in terms of events and processes, continuity and reuse, and the creation of physical or deep-time monumentalities.

09 CONSTRUCTING SACRED LANDSCAPES IN GREECE

Author(s): Schlaman, Marjo (University of Amsterdam)

Presentation Format: Oral

Today, landscape archaeology is mainly the collaborative result of archaeological, historical geography, and physical geography approaches. In Mediterranean landscape studies, the exploration of landscapes as a reflection of a multi-layered process and experience, within notions of representation and perception, are a matter of integrated research that only just started. Although intensive surface exploration revealed cultural landscape dynamics, this type of research hardly studies the reflexivity of religious monuments or the 'sacredness' of the landscape in the eye of the beholder.

One of the main approaches of landscape studies that notify the complex representational dynamics of landscape is the 'biography of landscape'. This approach considers the landscape as the result of a multifaceted interaction between agency, structure and process. The biographical approach applied in my study connects the establishment and maintenance of cult places by people in the past, to long-term environmental and social political developments. My study examines how landscape, cult place and people interrelate in constructing sacred landscapes, by making use of five key concepts of a landscape's characteristics. It compares two geographical different regions: the Argolid and South Ionia, both with cult places that were in use during ± 900 until ± 350 BCE. The comparative approach by means of archaeological, geological, and written sources, enables to clarify the differences that occur in the sacred landscapes concerning the physical landscape in relation to the location of the cult places, the continuity of cult places, and the reuse of earlier remains.

10 BETWEEN THE DEVIL AND THE DEEP BLUE SEA? NEOLITHIC ENCOUNTERS AT THE SEASHORE AT SLETTABØ, SW NORWAY

Author(s): Armstrong Oma, Kristin (University of Stavanger, Museum of Archaeology)

Presentation Format: Oral

Slettabø in SW Norway is a site of several, temporally and relationally specific, seashore encounters, most notably one phase that represents an encounter with the Bellbeaker complex (BBC). Encounters encompass meetings that hold potential rupture and upheaval, that become significant turning points. The spread of the Beaker folk is frequently understood as a series of encounters. I investigate whether this site indicates full-scale Bellbeaker culture or responses from societies on the edge. The harbour site of Slettabø with its Bellbeaker is still unmatched but recent finds of Bellbeaker arrowheads demonstrate more widespread BBC interactions, or controlled encounters from designated places. BBC people, animals and objects can be glimpsed obliquely on sites that became places of encounters between different kinds of beings. Cattle bones demonstrate that humans and animals both were a part of encounters that steered Neolithic societies towards a more settled farmlife.

My approach is informed by the relationality and the ontological turn, and explores the BBC as being, simultaneously, a state of mind and a material culture with a wide geographical span. The encounters in themselves as well as their settings were important for the trajectories of the spread of the BBC throughout different receiving societies. I investigate the material culture, structures and landscapes where such encounters took place on the Norwegian coast. Rather than full-scale invasions, the BBC was spread at sites of encounters between "ambassadors" and locals, and the "ambassadors" were not all human but also cows. The ensuing development of these cultural meetings was a response by a local community that did not include a wholesale takeover. Thus, by investigating local responses to encounters with "ambassadors" from the BBC conclusions about invasions drawn by recent studies of ancient DNA can be challenged.

11 CONVEYING IDENTITY THROUGH PLACE: UNDERSTANDING BRONZE AGE PEOPLE AND SOCIETY VIA NUCLEATED SETTLEMENTS

Author(s): Ryan, Chelsea (National University of Ireland, Galway)

Presentation Format: Oral

Irish Bronze Age (2200-600BC) settlement studies are dominated by roundhouse farmsteads and hillforts. Based mainly on these remains, there are two prevailing theories for the social structure of Bronze Age society in Ireland:

- 1) People existed within a non-complex economy, where self-sufficient farmers relied on neighbouring homes for exchange of social customs and economic resources.
- 2) People existed in a competitive, centralised society with hierarchical divisions (i.e. community, territory and chiefdom).

While each argument presents a compelling interpretation of communal identity, they lack proper analysis of a third settlement type, nucleated settlements, as well as a holistic theoretical approach regarding a settlement's role in the process of place-making and identity creation. This paper will demonstrate that applying such an approach to an in-depth landscape analysis of nucleated settlements will enhance our understanding of Bronze Age society in Ireland.

At least ten of the nucleated settlements (20-288 roundhouses) can be found in varied landscapes with clear multi-period evidence suggestive of strong place continuity. The evolving relationality of these places over time is an important consideration of this study.

The study also focuses attention on individual identity as a complement to previous discussions on the relationship between settlement and community. Moreover, the study will explore the social and spatial relationships between settlements and the meaningful places found in their wider archaeological landscape.

Resulting interpretations have the potential to establish a more nuanced comprehension of how social, political, and ideological associations overlap according to place. Consequently, this will provide a diachronic context regarding how people, as individuals part of a community, relate identity with place.

12 BURIAL MOUND CONSTRUCTION AS A SENSE OF TIME AND PLACE IN LATE IRON AGE SCANDINAVIA

Author(s): Cannell, Rebecca (University of Oslo)

Presentation Format: Oral

When we think of place in Archaeology, we often think of buildings, burials or other monuments within a landscape filled with the topographic features we see today. This can be informed and accurate, based on data gathered, but often portrays a static scene focused on prominent events. This misses the subtle dynamics of natural processes such as atrophy, decay and regrowth, and that which connects the features and monuments, the earth itself. Natural places, and by extension, natural materials, can create an individual and shared sense of place and identity, and form an interactive framework for ordinary and extraordinary activity. These aspects are in some ways harder to interpret for sedentary, agricultural societies with complex trade patterns, because we focus on the human-made constructions and objects, often in an economic and practical sense, or connected to socio-political expressions and power relations. Burial mounds are usually considered in terms of what they contain and where they are, rather than what they are made of and why. Soil is a resource no sedentary society can be without, and this living vessel coating the landscape is often taken for granted. A sense of temporal place can be expressed via natural materials, as this presentation will explore. Considering the materials used to construct burial mounds in Late Iron Age Scandinavia, we can see design and purpose, and materials imbued with properties beyond the functional. The exterior and interior forms of a burial mound are often intentional, and the soils and sediments used can show us more than simply the past environment. They contain references to places within the landscape; the use of soils and sediments expresses relationality and a need to endure as part of the spiritual and social world. These themes will be explored via examples from Late Iron Age southern Norway.

13 REPEATING TIME: DURATION, HISTORY AND BECOMING ON THE ARDNAMURCHAN PENINSULA

Author(s): Harris, Oliver (School of Archaeology and Ancient History)

Presentation Format: Oral

In this paper I want to examine how relational processes of repetitive placemaking work over millennia. Rather than focusing on traditional notions of re-use or re-encounter, I want to explore how the process of archaeology allows us to unpick different registers of time that we normally conflate. By attending to the differential, affective and intensive connections that link places, and to the way our own practices reveal them, I suggest we can develop a new way of thinking through long-term landscape connections. Furthermore, by employing a range of different concepts we can re-situate a traditional concern for history within other modes of time. Specifically, I intend to explore the potential for parsing duration, history and becoming as different registers through which both difference and repetition emerge. These issues will be explored in the setting of the work conducted by the Ardnamurchan Transitions Project in Western Scotland since 2006, and our excavations of a range of sites dating from the 4th millennium BC to the 19th century AD. At the heart of this lies the chambered tomb of Cladh Aindreis, a Neolithic monument in one sense, which enfolds time, and both endures and erupts as an event again and again over 5500 years.

14 THE ETERNAL HOME

Author(s): Beck, Anna (Museum Southeast Denmark)

Presentation Format: Oral

A dwelling is one of the most central places in a human life. Not only because it represents shelter and a place to stay, sleep and eat, but also because it is a place to feel 'at home', a place to belong, both socially and emotionally. The archaeological definition of a home has often been focused on the concrete material set-up of the dwelling. Instead, I will argue that it is the temporality created through the materiality of the dwelling that constitutes the 'feeling of a home'. Through material practices and components, including reuse and monumentalisation of sites, a sense of stability, continuity and immutability - or in other words: of 'eternity' - is actively created in a world that is characterised by ongoing change independent of the actual time spent in one place. In the paper, the temporal concept of eternity will be discussed in relation the home-making practices by juxtaposing two archaeological case

studies that both represent distinct homes but in very different contexts and of very different temporal orders: the settlements of the Scandinavian Late Iron Age (500-1000 AD) often lasting centuries and the tent camps at the present one week long rock festival at Roskilde, Denmark.

15 ON THE INSISTENCE OF OLD WALLS AT ÇATALHÖYÜK, 7000 BCE - 2017 CE

Author(s): Kay, Kevin (University of Cambridge)

Presentation Format: Oral

Around 6400 BCE, a group of people dug a massive trench into the tell at Çatalhöyük in order to locate and disassemble a certain old, half-topped and buried mudbrick wall. In 2017 CE, the same action was repeated in search of the same wall. Understanding what it is that both groups were seeking to accomplish, at great expenditure of effort, requires us to dig to the foundations of how architecture acts and is acted upon politically in social worlds.

Architecture has long been recognized as a difficult object in archaeology because of its temporal and scalar complexity. Working from the concept of architecture as an assemblage of affective elements (Harris & Sørensen 2010; Bille & Sørensen 2016), I distinguish three of the registers on which material components of buildings act, often simultaneously: (1) the intensity of formative practice, when bodies and materials interact and rapidly shape one another; (2) the insistence of standing architecture, its individuated input into the processes and scenarios in which it plays a role; and (3) the embedding of architecture in larger, emergent phenomena like cityscapes and tells. Each of these has implications at different scales, and carries different political potential. Following the biography of old walls as a history of the activation and de-activation of these different registers helps to illuminate the way the matter of Çatalhöyük has been engaged with and worked-through socially over many years. In particular, the production of insistent forms from within an aggregated tell implies specific ways of knowing, politicizing, and situating old architecture. Through the example described above and other material engagements with old walls at the site, I explore this long-lasting political potential of architecture that was drawn on, not dissimilarly, in both 6400 BCE and 2017 CE.

16 DWELLING IN PLACE: THE LONGHOUSE BUNDLING PAST, PRESENT, AND FUTURE IN LATER PREHISTORIC SCANDINAVIA

Author(s): Eriksen, Marianne Hem (University of Cambridge; University of Oslo)

Presentation Format: Oral

Architecture is inextricably caught up with both temporality and relationality, as a building is an aggregate of interlinked materials, inhabitants, architectural features, practices, and artefacts - operating at different speeds, co-creating a specific place, and unfolding over time. The three-aisled longhouse survived in Scandinavia through approximately two and a half millennia, from the Bronze Age through the Viking period. Each house in the trajectory of this house type constitutes simultaneously a series of events, a manifestation of long-term social memory, and an active choice to rebuild, essentially, a similar house again and again. The longhouse itself can thus be seen as a 'line of becoming' that gathers force through repetition over deep time. Simultaneously, each generation of builders would make deliberate spatial choices of how to relate a new house to dispersedly settled, yet networked social landscapes.

Drawing on ongoing research on the development of the longhouse in Norway, this paper will map different practices employed by prehistoric housebuilders to engage with materialities of the past, or potentially even with the future, and thus explore how different temporalities were bundled together within a place of dwelling. These practices include constructing houses superimposed over or touching mortuary monuments, returning after centuries to place the dead in an older longhouse, or building a new house on top of a long-abandoned dwelling. Are these activities best understood as common-sensical, rational strategies of an economical-political nature? How does the role of the longhouse as an affective field, providing a sense of time and place, relate to the deliberate accumulation or reassembling of older material remains? Moreover, what does these practices convey of the sense of place at sites which lie dormant for centuries and then are reactivated with bursts of intensity?

a. INTO THE SITE: ARCHAEOLOGY WITH SOLITUDE. A CREATIVE EXPERIENCE OF THEORY IN A META-ARCHAEOLOGICAL SITE

Author(s): Mármol Martínez, José Antonio (Complutense University Madrid)

Presentation Format: Poster

In 2016 we made a fake archaeological site where we did educational excavations. The site were made with contemporary materials imitating an ancient 19th century local house, where we experimented with technics and bodily experiences prior to its manual earthing. A month later the excavation happened, and we dug this fake site in an archaeo-artistic exercise. Since July 2016 the site remained abandoned suffering the time passing until November 2017 when myself alone came back to the site, with the intention of digging what had been left behind. This time the excavation was real -the site had been earthing by natural processes. This exercise of meta-archaeology, digging a site formerly created as a archaeological site itself -now becoming real, 'authentic'- let to an unexpected creative, affective experience where my figure as a solitary archaeologist remembered those young idealists like Chris McCandless or Everett Ruess who inspired by London, Thoreau or Tólstoi went far away from Society, into the Wild, to live a phenomenal transcendence. In this poster I show the personal process of this solitary excavation in this contemporary site, into the urban

wilderness, trying to incorporate a creative thought into this theoretical archaeological practice, a forward reading with materials in the search for avoid the dissymmetries of modernity, as well as the modern, artificial and ocularcentric ontology of mainstream archaeology.

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THE INTERSECTIONS OF MEMORY AND ROCK ART: TOWARDS A MULTIDISCIPLINARY APPROACH

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Zubieta Calvert, Leslie (Universitat de Barcelona; Rock Art Research Institute, School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand; School of Social Sciences, Archaeology and Centre for Rock Art Research + Management, The University of Western Australia) - Cretin, Catherine (Musée National de Préhistoire, Ministère de la Culture; UMR 5199 - PACEA, CNRS, Université de Bordeaux) - Bacelar Alves, Lara (Centre of studies in Archaeology, Arts and Heritage Science - CEAACP, University of Coimbra)

Format: Regular session

Memory has prompted a wide arrange of research issues related to the human mind and behavior. Archaeology, anthropology, linguistics, psychology and neuroscience have importantly contributed to address this vast concept. Memory here refers to people's capacity to remember and pass on knowledge. Memorisation techniques have been researched in Oceania, Africa and the Americas, finding that material culture along with intangible culture such as words/song, dance and music, sensorial experiences and emotions, actively assist in the creation of memory and specific narratives of identity. Rock art as a mnemonic device has been suggested in European archaeology since the early 2000s, particularly in Scotland. The lack of direct information about the social practices related to prehistoric rock art in Europe, however, has been overcome by the critical use of ethnography from contemporary communities around the world.

This session aims to further contribute to the study of rock art and its role in memorization processes, social memory and passing of knowledge. It also aims bringing together thought-provoking archaeological work that discusses methodological and theoretical approaches towards the study of the relation between rock art and memory through perspectives such as landscape, gender and material culture. Because of the complexity of the multidisciplinary entanglement required to address the aforementioned relationship, we encourage colleagues from around the world and from cognate disciplines to join us in order to discuss how their approaches and findings can argue for a better archaeological approach to the study of the intersections of rock art and memory.

ABSTRACTS

01 CREATION PROCESSES BEHIND ROCK ART: THE ROLE OF MEMORIZATION IN PASSING ON CULTURAL KNOWLEDGE

Author(s): Zubieta Calvert, Leslie (Universitat de Barcelona; CRAR+M, UWA; GAES, RARI, Wits)

Presentation Format: Oral

People around the world and through time have created ways to remember events and to pass on knowledge. The relation between material culture and memory in contemporary, recent past and ancient societies has been investigated in a wide range of contexts around the globe. This paper aims to critically discuss how the study of memorization practices opens a range of possibilities to analyze the creation processes behind rock art looked as a part of a wider range of material culture. Rock art in this sense are not static depictions placed on a rock surface but interconnected to other objects, people, the landscape and knowledge. My interest in those connections stemmed from two influences during my postgraduate studies in Africa (mainly) and Australia. I will also discuss some of my recent findings in Mexico as part of my on-going Marie Skłodowska-Curie project MEMORISING. These culturally different case studies will shed insights for a comparative study on the relations between memory and rock art, understood here as a multisensorial process in which language, performances, repetition, sound, touch, and emotions play a part.

The research described here will incorporate the importance of performances, interpersonal relationships and social rules to promote social memory and knowledge exchange. I will also discuss some of the challenges I have encountered when making those connections. Thinking critically on anthropological understandings of memorization techniques and where the ethnographic enquiry has been crucial to posit question on the relationship between rock art and memory, can contribute to archaeology to touch on other general goals of our discipline, such as the understanding of human creativity. I contend that this multidisciplinary approach will allow us to develop analytical tools to critically deal with the complexity of the material worlds that lie as the foundation of our discipline.

02 MEANINGFUL LANDSCAPES, MEMORIES IN STONE

Author(s): Valdez-Tullett, Joana (Historic Environment Scotland; University of Southampton)

Presentation Format: Oral

The archaeological record is composed of several layers of information. Some of them are material and directly accessible to the

archaeologist, others are an intangible, but intrinsic part of the data. That is the case with memory, inherent to human kind and pertaining to an important role in landscape enculturation. Rock art, particularly the open-air traditions, can be seen as a mechanism of landscape appropriation and the materialization of long-lasting memories.

This paper explores the temporal diachrony of rock art sites created by temporarily dispersed communities, materialized through the appropriation of carved and painted symbols on rock surfaces. Whilst the original meaning of these depictions may be lost, their shapes and particularly the places where they were created maintain degrees of importance throughout time. The addition of other motifs, the modification of symbols or even the destruction of some of these sites reflect their importance through adoption, adaptation and transformation, not only of their materiality but the natural landscapes upon which they sit.

This paper will discuss a number of rock art sites from Portugal that display obvious signs of later appropriations. In some cases, panels have been carved with images from the Palaeolithic through to the 19th century. Conclusions result from an empirical knowledge of the landscape and rock art involved, assessed through a landscape perspective.

03 GEOGRAPHIES OF THE INVISIBLE. ROCK ART, MEMORY AND ANCESTRAL TOPOLOGIES IN WESTERN IBERIA

Author(s): Alves, Lara (CEAACP / University of Coimbra)

Presentation Format: Oral

With few exceptions, Western European archaeologists turn to other continents in the quest for anthropological approaches to rock art, after the idea that dealing with issues such as memory or oral tradition related to its prevailing uses would be unfeasible within the scope of European contemporary industrialised societies. However, there are still regions that did not undergo the dramatic changes triggered by a replacement of the population settled in rural territories. In western Iberia, rural landscapes kept their social, economic and cultural structures for centuries (or even millennia!) largely unaltered, maintaining ancestral bounds to the land and to what the land had to offer. These come to light almost exclusively through story telling and memories of an ancestral world encapsulated in natural features in the landscape, such as natural rock formations and water sources but also archaeological remains like rock art or megaliths. These sites participate in the mapping and topological construction of the villages' landscape and, consequently, in the preservation of territorial custodian rights materialised in the performance of annual rituals.

The practice of carving signs on rocks persisted until recent decades. Rock art sites not only have place-names but are imbued with legends recounting the story of supernatural beings -'Enchanted Mooresses'- who are believed to live in rock outcrops or large boulders and are often responsible for their transport and placement in the landscape.

This paper draws on evidence gathered in 20 years of rock art research in which the collection of ethnographic references was integral to fieldwork. It addresses the role played by rock art in the perception of time and construction of space in the long term, captured in collective memory, highlighting the fact that only the preservation of this oral tradition, which is rapidly fading, allow us to grasp mythological geographies, that otherwise remained invisible.

04 KIMBERLEY VISIONS OF SNAKES, WANJINA AND QUARTZ CRYSTAL: ROCK ART, ETHNOGRAPHY AND MATERIAL CULTURE IN THE EAST KIMBERLEY, AUSTRALIA

Author(s): Harper, Samantha (Centre for Rock Art Research + Management; University of Western Australia)

Presentation Format: Oral

This paper explores collective memory and the sharing of cultural knowledge via rock art, utilising the rich ethnography available around Wanjina mythology in the Kimberley, Northwestern Australia, with a particular focus on the associated portable referents of cultural practices. These themes are explored using an East Kimberley, Northwestern Australian rockshelter (DRY007) as a case study, as recorded and excavated within the 'Kimberley Visions' project. Extensive rock art recording, excavation and archaeomorphological work has been undertaken at this site as part of the Visions project, however this paper focusses on an interpretation of this site relating specifically to quartz crystal, Wanjina and snake motifs, and the recorded ethnographies which link these together.

It is proposed that this place has functioned as a place where knowledge is marked in the painted rock art, and where social memory is taught, shared and reiterated. This art may have functioned as a mnemonic locale for Wanjina and snake mythology to be taught, sung and performed, as suggested by the preponderance of these motifs combined with the quantities of non-local quartz crystals brought into the site. The proposed intangible culture of performance at this site will be discussed in relation to the iterative processes of updating and modifying Wanjina here (Morphy 2012), creation of rock art in general, and the actions of bringing in crystals, and leaving them in place. Together, these actions are interpreted as integral to maintaining social memory amongst this cultural group.

Morphy, H. 2012. Recursive and iterative processes in Australian rock art: an anthropological perspective. In A companion to rock art. Blackwell companions to anthropology series, edited by J. J. McDonald and P. M. Veth. Oxford, Malden: Blackwell Publishing, pp. 294-305

05 IN THE FOOTSTEPS OF THE ANCESTORS: ASPECTS OF MEMORY IN N. W. AUSTRALIA ROCK ART

Author(s): Rainsbury, Michael (Ustinov College, Durham University)

Presentation Format: Oral

There are many different motivations for the production of rock art, and the preservation of memory may be one of the contenders. In my presentation I would like to discuss examples from northern Australia whereby memories such as a frightening encounter with a snake, or the loss of a large fish from a fishing line are illustrated in rock shelters. A child's hand stencil may belong to a now elderly person visiting a site, and so lead to a series of reminiscences of how traditional life used to be lived. In North West Australia the approach to a Wandjina art site by traditional guides manifested memories of the Ancestral Being's original path through the country. As far as the guides were concerned it would not be possible to visit the site by any other way. Memory too is present in the traditional Australian Aboriginal practice of creating ground paintings. This has now been transferred to the production of acrylic paintings on canvas for the tourist market. The sacred memories of ancestral life and travels displayed through the ephemeral mediums of coloured sand and feathers are now preserved on canvas, and edited, secular explanations revealing different aspects of meaning and memory, are now offered.

06 RIVER, ROCK, AND 'THE RAIN'S MAGIC POWER': ON THE SIGNIFICANCE OF ROCK ART RE-MEMBERED IN THE NORTHERN CAPE, SOUTH AFRICA

Author(s): Morris, David (McGregor Museum; Sol Plaatje University, Kimberley)

Presentation Format: Oral

Interpretations of the Driekopseiland rock engraving site in South Africa have rehearsed a range of perspectives on rock art. Description and classification endured as a *modus operandi* in archaeology and rock art studies through much of the last century. The distinctive style of the engravings at Driekopseiland, and preponderance of geometric motifs, resulted in an overall tendency to explain by typology. A common thread has been to match style with the ethnicity of people inhabiting the area in precolonial times. Such a typological approach ignores the characteristics of place, and the emplacement of the art on an expanse of glacial pavement aligned with the bed and flow of the Riet River, where the waters rise seasonally to submerge the engravings. A different perspective emerged when these elements of place and environmental contingencies were related to beliefs and practices of indigenous people, specifically the coming-of-age rites of young women, which variously reference cosmological processes associated with rivers and rain, the moon, and a mythical watersnake called !Khwa. Memory of the site's meaning was essentially erased by the colonial experience – dismembered, one could say, as original inhabitants were dispossessed of the land, itself carved into farms and administrative districts; and dismembered further by rock art approaches that figuratively lifted motifs out of place for typological comparison. A re-membering of significance, with the aid of ethnography, has found resonance for individuals of descendant communities on visits to the site, who hint at issues of ritual danger and sensitivity. The paper cites an incident with a young person of rural background who, alert to ideas around 'the snake of the river', experienced an acute emotional response – triggered by the reconstructed narrative and by 'memory' activated by the power of the river and the rocks that are ritually marked.

460 SEA-PATHWAYS: NEOLITHIC ON LITTORAL ENVIRONMENTS

Theme: Mediterranean seascapes

Organisers: Oms Arias, F. Xavier (SERP. Secció de Prehistòria i Arqueologia. Universitat de Barcelona) - Cubas, Miriam (University of York)

Format: Regular session

The spread of the agriculture to the Southwest of Europe is one of the most important phenomena in the history of the humankind. In this context the sea-pathways played an important role as vehicle of expansion of the new subsistence practices, technology and cultural knowledge. The Mediterranean is one of the regions where these aspects are particularly apparent. However, exciting new data are arising from other coastal environments. The important novelties on the Atlantic, Baltic or North Sea reflect an increase in the density and quality of the research focused on the transition to the farming and livestock way of life in coast landscapes.

This session is intended as a forum for the critical assessment of the new data and for the discussion of the settlement patterns, the coastal resources and the spread of farming to littoral and inland environments. It aims to be a meeting among researchers who focused their activity on the study of neolithisation processes and Neolithic in coastal areas.

ABSTRACTS

01 NEOLITHISATION OF THE COASTAL AND INLAND LLOBREGAT BASIN (NE IBERIA)

Author(s): Oms Arias, F. Xavier - Daura, Joan (SERP, Universitat de Barcelona) - Sanz, Montserrat (Universidad Complutense de Madrid-ISCIII Evolution and Human Behavior Research Group) - Yubero, Maria (SERP, Universitat de Barcelona) - Mestres, Josep (Vinseum,

Museu de les Cultures del Vi, Vilafranca del Penedès) - Martín, Araceli (Servei d'Arqueologia i Paleontologia, Generalitat de Catalunya) - Cebrià, Artur (SERP, Universitat de Barcelona)

Presentation Format: Oral

Sets of data gathered through research into the NE of Iberian Peninsula (Llobregat Valley) have greatly contributed to our understanding of the Neolithisation process of the NW region of the Mediterranean basin. Similarly, to groups such as that of the Rhone-South Provence (France), Serpis-South Valencia (Spain) and Tagus-Estremadura (Portugal), the Llobregat group may be integrated in narratives about the Neolithisation of the Western Mediterranean region. In this work, we summarise the results obtained in such research and propose a local model repeated in several places at the western Mediterranean region with the same patterns: optimal local raw materials, endorheic plains, variate biotopes (that allow not just Neolithic practices, but gathering-hunting too) and the presence of an estuary, the rapid way to connect coastal to inland territories (pre-littoral environments with elevations between 100 and 1000 msnm). Llobregat basin, as the other regions cited above, is a good example to test the Neolithisation patterns along the western Mediterranean, the arrival to coastal sites and their entrance to the inland territories between 5650-4800 cal BC. The presence of more than 50 archaeological sites in this region (c. 25 have recent archaeological data) will facilitate our analysis. Finally, we will compare our results with the existing data from other Neolithic territories in western Mediterranean basin.

02 THE EBRO BASIN (NE IBERIA) AS AN EARLY RECEPTOR OF COASTAL NEOLITHIC

Author(s): Laborda, Rafael (Universidad de Zaragoza)

Presentation Format: Oral

Different studies pointing out the Mediterranean coastal as a first place for the arriving of the Early Neolithic to Iberian Peninsula, around 5600 cal BC. The presence of a natural corridor as the Ebro Valley, which connects Central Plateau and Mediterranean coastal, could play an important role for the Neolithic spread, from to coastal areas (cardial style) to inland ones (impressed, incised-impressed and boquique technique). In this sense, the Ebro Basin shows a remarkable number of Early Neolithic sites dated in 5600-4800 cal BC with short-life radiocarbon samples and where both wares are represented in the archaeological register.

In this work, we studied the pottery assemblage together with radiocarbon dates of twenty Early Neolithic sites located in the Ebro Basin. We found two well defined moments. The first one is developed until 5300-5200 cal BC and is characterized by the scarcity of Early Neolithic sites. These are more usually found in coastal areas, just with the exception of Cueva de Chaves (160 km from the Mediterranean Sea). The second phase was developed as from 5300-5200 cal BC. This moment is characterized by a considerable increase of the number of the sites and the Neolithic spreading towards the inland and mountains zones, less favourable to agriculture. Different theories have been proposed about the first Neolithic peopling of the Ebro Valley. This study gives an approach of the Early Neolithisation process of the inland territories, from the Mediterranean trough the Ebro Valley.

03 APPROACHING THE MANAGEMENT OF COASTAL RESOURCES IN THE NEOLITHIC: CASE STUDIES FROM THE BARCELONA PLAIN

Author(s): Breu, Adrià - Gomez, Anna - Nadal, Jordi - Molist, Miquel (Autonomous University of Barcelona)

Presentation Format: Oral

The development of contract archaeology in the city of Barcelona since the 80's has yielded a wide and important archaeological sequence covering all the chronological stages in recent prehistory. The Neolithic stands out with more than 10 archaeological interventions spread around the present Raval quarter, which suggests the existence of a significant human settlement underneath the city.

The goal of this presentation is to evaluate the strategies this communities might have developed in order to manage coastal resources, both marine and terrestrial. To this goal, all available direct and indirect evidences from the settlements excavated to date have been put together, especially marine products such as malacological remains. Given that the majority of the excavations have been performed by a variety of contract archaeological teams, this analysis has certainly helped generate a more general picture that helps better understand the economic strategies put in place by the first farmers in the Barcelona plain.

The paleoenvironmental setting and the chronological sequence related to space and use will be presented and, finally, these evidences will be contextualised with nearby settlements in the Maresme, Baix Llobregat and Penedès regions and also with other coastal areas with well documented Neolithic remains along the western Mediterranean (Gulf of Cadiz and Marseille amongst others).

04 MARINE RESOURCES EXPLOITATION IN THE NEOLITHIC SITES OF THE BAY OF CÁDIZ DURING THE VTH AND IVTH MILLENNIUMS BC

Author(s): Cantillo Duarte, Juan Jesus - Vijande Vila, Eduardo - Ramos Muñoz, José - Domínguez Bella, Salvador (Universidad de Cádiz) - Cuenca Solana, David (Universidad de Cantabria)

Presentation Format: Oral

This work examines the role played by marine resources for neolithic groups in the Bay of Cádiz at the end of the Vth millennium and during the IVth millennium. We have analyzed new evidences of marine fauna collected at the neolithic village of Campo de Hockey (San Fernando, Cádiz) and in the settlements of La Esparragosa (Chiclana de la Frontera, Cádiz) and SET Parralejos (Vejer

de la Frontera, Cádiz), belonging to the so-called "Silos Fields culture". The high presence and variety of marine species, specially *Ruditapes decussatus*, *Solen marginatus* and *Glycymeris* sp. and the gasterops *Patella* sp. and *Phorcus lineatus*, which is obvious given the coastal nature of the settlements, highlight the importance of these resources as foodstuffs at a time of consolidation of agricultural and livestock practices. This great taxonomic variability demonstrate an excellent knowledge of the marine environment as they collected taxa that lived in mesolittoral and infralittoral zones. We also note the importance of these marine resources for ornamental purposes playing an important role in the ideological sphere in some funerary practices. Furthermore, functional analysis have identified the existence of ten shell tools from the archaeological site of Campo de Hockey and SET Parralejos, used for works of daily life.

05 OPEN AIR SITES IN COASTAL ENVIRONMENTS DURING THE LATE PREHISTORY: URIBE KOSTA (NORTHERN SPAIN)

Author(s): Cubas, Miriam (Sociedad de Ciencias Aranzadi-University of York) - Ríos-Garaizar, Joseba (Centro Nacional de Investigación sobre la Evolución Humana - CENIEH, Burgos) - Garate-Maidagan, Diego (Instituto Internacional de Investigaciones Prehistóricas de Cantabria - IIIIPC, Gobierno de Cantabria, Santander) - Libano-Silvente, Iñaki - Ugarte-Cuetara, Ander - Vega-López, Sergio - Regalado-Bueno, Encarnación (Edestiaurre Arkeologia Elkartea) - San Emeterio-Gómez, Aixa (Centro Nacional de Investigación sobre la Evolución Humana - CENIEH, Burgos) - Tapia-Sagarna, Jesús (Sociedad de Ciencias Aranzadi) - García-Moreno, Alejandro (Museo de Prehistoria y Arqueología de Cantabria MUPAC)

Presentation Format: Oral

The spread of the Neolithic to the west of Europe implies, among other features, a modification in the settlement patterns. Open-air villages became the most representative evidence of daily life activities. However, this archaeological record is scarce in some areas of the continent, especially in the south of the Atlantic coast. The Prehistory in the Cantabrian region (Northern Iberian Peninsula) has been built up mostly from archaeological sequences recorded in caves. However, this aspect implies an important bias in the case of the Late Prehistory when the open air settlements were the main scenario of the daily life.

In this contribution, we present the coastal occupations carried out in Uribe kosta, located in the eastern of the Cantabrian region, during the Late Prehistory. First discoveries were made in the 1950's, and since then, numerous lithic assemblages have been collected on surface. Since 2007, systematic research has been carried out in the area with the aim to recognise the open air occupations of the earliest farmers communities. This project includes the excavation of new open air sites, superficial surveys to identify burial mounds and new artefact studies, such as polished tools, pressure blade cores, arrowheads and ground mills. New archaeological sites have been identified (Landaluze and Aranbaltza II) where different structures may represent different activity areas of a permanent and continuous settlement. The available radiocarbon dates for Landaluze are coeval with the spread of megalithic monuments in the region. At the same time, the analysis of lithic tools, especially the arrowheads, has allowed us to propose a long term occupation of this area.

Preliminary data suggest that the implantation of farmer communities in the area was clearly more complex than previously considered with strong evidence of permanent settlement with domestic structures, specialized lithic productions and symbolic transformation of the landscape.

06 EL CAVET (TARRAGONA, NE IBERIA) 5600-3000 CAL BC: NEOLITHIC SETTLEMENT STRATEGIES IN A COASTAL ENVIRONMENT

Author(s): Marsal, Roser (GRACPE-PROA, Grup de Recerca sobre l'Arqueologia de la Complexitat i els Processos d'Evolució Social - Pròxim Orient Antic, Secció de Prehistòria i Arqueologia, Universitat de Barcelona) - Vergès, Josep M. - Fontanals, Marta (IPHES, Institut Català de Paleoeologia Humana i Evolució Social) - Martinell, Jordi (Departament d'Estratigrafia, Paleontologia i Geociències Marines, Universitat de Barcelona) - Allué, Ethel (IPHES, Institut Català de Paleoeologia Humana i Evolució Social) - Morales, Juan I. - Cebrià, Artur - Pedro, Mireia - Oms, F. Xavier (SERP, Seminari d'Estudis i Recerques Prehistòriques, Secció de Prehistòria i Arqueologia, Universitat de Barcelona)

Presentation Format: Oral

El Cavet is an open-air site located just at 1 km of Cambrils current coastline (Tarragona, Spain). The site is situated in a slight slope (17-22m amsl) between two seasonal streams (Regueral and Riudoms) separated only 340 meters between them. Since 2005, three different sectors have been excavated and each of them yielded well-defined features. In Sector 1, 15 pits have been excavated, five belonging to the Early Neolithic (UE2012, UE2014, UE2016, UE2007 and UE2009), while the others provided later chronologies. In Sector 2 there are over 150 structures and an area with two superimposed archaeological layers. Only five structures have been excavated and their chronology remained undetermined due to the undiagnostic traits of the recovered material. The two archaeological layers have provided evidences of Early Neolithic occupations. The third sector worked at the site (Collector Sector) is topographically higher and we have just excavated a test pit, identifying a large structure with Late to Early Neolithic layers.

This presentation will be devoted to present the different structural features, the long-term occupation sequence, the chronology, the cultural evolution of an Early (Cardial) to Late (Veraza) Neolithic large open-air site and the economic significance focusing specially in the exploitation and management of coastal resources.

a. THE COASTAL PALAEOENVIRONMENTAL EVOLUTION OF PEGO-OLIVA DURING THE MESOLITHIC-NEOLITHIC TRANSITION (WESTERN MEDITERRANEAN): A CONTRIBUTION TO THE “MARITIME PIONEER COLONIZATION MODEL”

Author(s): Brisset, Elodie - Fernández-López de Pablo, Javier (Institut Català de Paleoeologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili - URV) - Burjachs, Francesc (Institut Català de Paleoeologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili - URV; ICREA)

Presentation Format: Poster

The Iberian Peninsula is characterized by a rapid spread of Early Neolithic sites, a spatial discontinuity of the implantations, in the meanwhile of persistence of Late Mesolithic hunter-gatherers. So far, the most convincing model to explain those evidences is the “maritime pioneer colonization” implying that earliest Neolithic settlements were implanted in unoccupied areas (Isern et al., 2017 - PNAS). In order to investigate the reasons why this area become depopulated during the Final Mesolithic, we examined the relationship between Early to Middle Holocene environmental coastal changes and the Late Mesolithic settlement distribution in the coastal area of Pego-Oliva, Valencia region (project MedCoRes: H2020-MSCA-IF-2015 ref. 704822). By reconstructing the sedimentary architecture of the basin in a well-constrained chronological framework, our results show that the inland migration of the coastline consecutive to Early-Holocene sea-level rise has led to the progressive reduction of the coastal plain causing the complete disappearance of previously lagoonal ecosystems dated at 8200 cal. BP. Because of those paleoenvironmental changes are significantly concomitant with the latest Mesolithic occupation in the study area; we propose that deep modification of coastal biotopes may have rendered those landscapes less attractive to the last hunter-gatherers, favouring colonisation of uninhabited areas by the first farmers.

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DIVERGENT LIFEWAYS: TRACING SOCIO-CULTURAL AND ECONOMIC VARIABILITY WITHIN THE MEDITERRANEAN AND BALKAN NEOLITHIC

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Kloukinas, Dimitris (Ephorate of Antiquities of Kozani, Ministry of Culture, Greece) - Voskos, Ioannis (National and Kapodistrian University of Athens) - Andreasen, Niels (Copenhagen Museum)

Format: Regular session

Although the term Neolithic appears to be vague in many respects, there seems to be a common consensus regarding the main characteristics it encompasses. These refer, for instance, to a consolidated lifeway including aspects such as sedentism, agropastoralism and concomitant developments in material culture and ideology. Nevertheless, in many occasions, the elements commonly viewed as belonging to an established “Neolithic package”, do not seem to coexist. Indeed, a closer examination of the record on both an inter- and intra-regional level reveals considerable variability in terms of cultural and socioeconomic manifestations. Thus, viewing the Neolithic as a strictly defined entity is not always justified by the available evidence. Rather than retaining linear narratives of social evolution, modern approaches to the subject should highlight variable expressions and trajectories transcending the perceived norms.

This session seeks to assemble and discuss different case studies in order to explore alternative or diverging ways of life within a temporal context that is primarily defined as ‘Neolithic’. The geographical area under consideration will include the Mediterranean region and the Balkans. The discussion will focus on communities or micro-regions presenting atypical or paradox traces that are not solely explained by cultural isolation and the transitional or early status of the neolithisation process. Contributions referring to alternative subsistence strategies, diverse expressions in the organisation of the built environment, differential degrees of mobility and interaction between contiguous communities, as well as other relevant issues, are strongly encouraged.

ABSTRACTS

01 FROM WHENCE WE CAME: THE CYPRIOT ROUND HOUSE PHENOMENON AND ITS LONG-TERM RELATIONSHIP WITH THE NORTHERN LEVANT

Author(s): Clarke, Dr Joanne (Dept of Art History and World Art Studies) - Wasse, Alexander (University of East Anglia)

Presentation Format: Oral

Rectilinear architecture, which had been increasing in predominance since the Late PPNA in the well-watered agricultural basins of northern Syria and Upper Mesopotamia, failed to be adopted on Cyprus, even though it was experimented with during the 8th millennium BC at Akanthou. Instead, by the Late PPNB circular architecture became “highly formalized” on Cyprus representing the island’s ‘difference’ from the mainland and reinforcing the prevailing narrative of ‘island conservatism’ in the minds and interpretations of Near Eastern archaeologists. It is often forgotten however, that circular architecture never disappeared from the mainland and indeed was a continuous feature of the Neolithic of eastern Jordan. There is a tendency for scholars to privilege one region over another on the basis of geographical proximity and modes of life such that sites in the Jordanian badia like Wisad Pools are

interpreted within a different set of investigative parameters from those applied to contemporary Khirokitia on Cyprus, even though Khirokitia and Wisad Pools look surprisingly more similar to each other than to the Levantine corridor. In a seemingly unrelated context, circular architecture (re)-emerges around 6450 cal. BC in the northern Levant at sites like Tell Sabi Abyad, contemporary with Khirokitia and Wisad Pools. Akkermans (2010) writes "The recurrence of the circular monocellular buildings around the middle of the 7th millennium BC has no immediate cultural or technical roots; it implies both an innovation in architectural design and a fundamental departure from the long lived tradition of rectilinear construction." In this paper we explore the Round House Phenomenon in Late-7th millennium BC Cyprus, the Euphrates Valley, and the Jordanian badia and ask; to what extent are we witnessing varying modes of diffusion or simply observing the same phenomena occurring in different locations at approximately the same time with no causality or close relationship?

02 FOOD-PRODUCTION VERSUS FOOD-GATHERING: ECONOMIC FLEXIBILITY AS A DIACHRONIC STRATEGY TO SURVIVAL IN NEOLITHIC/CHALCOLITHIC CYPRUS

Author(s): Voskos, Ioannis (National and Kapodistrian University of Athens)

Presentation Format: Oral

Following a partly enigmatic Epipalaeolithic phase (Akrotiri phase), by the beginning of the 9th mil. BC food-producing communities appear in Cyprus. This development marked the beginning of a rather long Neolithic phase (c. 9000-5000/4900 BC) followed by an equally extended Chalcolithic phase (c. 5000/4900-2500/2400 BC). The majority of researchers investigating this period tend to focus either on the "Neolithisation" process per se or the socio-cultural circumstances that promoted this crucial development. Moreover, the existence of a consolidated "Neolithic package" (i.e. agropastoral character, permanent settlements) is usually taken for granted even though a number of scholars has highlighted several bizarre local characteristics. Ultimately, a closer look on the available archaeological record of Cyprus reveals atypical economic trends and other elements such as architectural design and use of space which suggest neither a frozen Mesolithic nor a fully Neolithic pattern. In this paper I will attempt to define the main economic characteristics of the Cypriot Neolithic/Chalcolithic period focusing on the 5th and 4th Millennium BC and highlighting the existence of a flexible programme of food-supplying. Traditional economic practices not only secured the survival of local communities in a largely unstable climatic and insular environment but also seemed to have been connected with specific socio-cultural trends defining a rather durable local identity.

03 UNDERGROUND 'DWELLING' IN LATE-5TH AND EARLY-4TH MILLENNIA BC, CYPRUS

Author(s): Clarke, Dr Joanne (Dept of Art History and World Art Studies)

Presentation Format: Oral

A common but little understood feature of the Neolithic and Early Chalcolithic periods in Cyprus is the presence of subterranean features. Sometimes (as in the case of Philia Drakos A) these features are associated with above-ground villages, but more often they appear to form the totality of a site for that period (as in the case of Kalavassos-Kokkinoyia, Mari-Paliambela and Parekklisha-Shil-lourokambos). There is considerable variety amongst these features, from complex fully subterranean chambers and tunnels, sometimes excavated over several 'stories', to individual and paired cavernous chambers, to extensive 'pit fields'. In almost every instance there is evidence that an initial activity took place in these features and then they were either 'closed' or used for storage. There are some shared commonalities within the variety, for example most have vertical shafts accessing the surface for air and light and some have stepped entranceways. To date, there are no satisfactory explanations for why people chose to 'excavate' into the earth at this time (and not at other times) and why only certain activities occurred in these spaces rather than a full range of daily tasks. What is evident is that the practice of digging chambers and tunnels and large cavernous pits was not unique to Cyprus. Contemporaneous with the Cypriot examples are the subterranean features in the southern Levant and in Egypt and looking more widely across the Mediterranean it is apparent that at different times in prehistory people chose to do things underground. By studying this phenomenon in different locations I am not imposing common causality or a close relationship, but rather I aim to deepen our understanding of this phenomenon more broadly.

04 THE PIT-DWELLING CONUNDRUM IN NEOLITHIC GREECE: ALTERNATIVE LIFEWAYS OR JUST ALTERNATIVE HOUSE FORMS?

Author(s): Kloukinas, Dimitris (Ephorate of Antiquities of Fthiotida & Evrytania)

Presentation Format: Oral

The existence of pit-dwellings during the Neolithic period of southeast Europe has been a long debated issue. The construction of less substantial living spaces could be supported by a series of excavated features that have been commonly attributed to the earliest phases of the Neolithic period or the initial stages of the settlements' occupation. Pit-dwellings have also been viewed as flimsier, ephemeral structures reflecting temporariness, simple socio-economic structures and a low degree of technological expertise. What is more, they are often associated with more mobile lifestyles based mainly on ethnographic parallels.

Regarding Neolithic Greece, the relevant record was significantly enriched by the excavations at Late Neolithic Makriyalos (Pappa & Besios 1999), where an extensive settlement comprising pit-dwellings has been uncovered. In contrast to earlier conceptions, recent research in the wider region has indicated that the distribution of this house type is neither geographically nor chronologically restricted. Therefore, the co-existence of alternative architectural forms, possibly reflecting alternative lifeways, can be supported

throughout the Neolithic period. The present paper will summarise the evidence at hand and will highlight the limitations posed. The latter mainly include the commonly arbitrary criteria used when identifying pit-like features as dwellings. The focus will also turn to different interpretative approaches referring to socio-economic structures, habitation patterns and varying degrees of mobility.

Reference

Pappa, M. and M. Besios (1999). The Neolithic settlement at Makryalos, northern Greece: preliminary report on the 1993-1995 excavations. *Journal of Field Archaeology* 26, 177-195.

05 THE UNKNOWN CHALCOLITHIC ERA IN NORTHERN GREECE: A CASE-STUDY FROM METHONI, CENTRAL MACEDONIA

Author(s): Tsiolianni, Panagiota - Papadopoulou, Stella - Veropoulidou, Rena - Orova, Niki - Kazantzis, George (Ephorie of Antiquities-Pieria)

Presentation Format: Oral

The introduction of the term “Chalcolithic” (in Greek prehistory) and the recognition of an autonomous chronological period describing the transition from the Neolithic to the Early Bronze Age are relatively recent developments in Greek prehistoric research. Past research and radiocarbon dates have demonstrated that there is an occupational gap of at least 500 years between the two successive phases of the end of the Neolithic and the Early Bronze Age. Recent discoveries and excavations in northern and central Greece have revealed small sized settlements dated by radiocarbon determinations to the middle of the 4th millennium. These sites seem to have particular characteristics that differ both from the previous Final Neolithic phase and from the (following) Early Bronze Age. One of these settlements has recently been revealed in/near the village of Methoni at the district of Pieria in central Macedonia. Despite the rescue character of the investigation and the limited area excavated, the archaeological data suggest that an extensive coastal settlement was developed at the site during the Chalcolithic period. The ongoing study of the site’s record provides further information for a period so far unknown in the region, and, therefore, contributes significantly to the research debate on the (well-known) chronological gap of the 4th millennium, as well as to the better understanding of the settlements’ nature and organization during this period.

06 EARLY NEOLITHIC OVENS FROM THE SITE OF LEPENSKI VIR: NEW SHAPE - OLD MATERIAL

Author(s): Đuričić, Ana (Laboratory for Bioarchaeology, Faculty of Philosophy, University of Belgrade)

Presentation Format: Oral

Even though the Early Neolithic material at the site of Lepenski Vir shows typical characteristics of the Starčevo culture, there are certain significant elements which are atypical for the Early Neolithic communities of the Central Balkans. One of the atypical elements are the ovens. In the Early Neolithic layers at the site of Lepenski Vir, a total of 5 ovens inside pit-dwellings were found. Based on the construction technology, 3 types can be distinguished – a dug-in structure made of burnt soil, an oven with floor and dome parts made of stone slabs, and an oven with stone slab foundation under the clay floor and a dome of an unknown material. The use of stone as a material for the construction of ovens, is yet unknown in the Early Neolithic of the Central Balkans. Ovens were usually features dug into the side of pit-dwellings and not free-standing installations. Only one out of the five ovens at Lepenski Vir shows the characteristics of a typical Starčevo culture oven. Moreover, stone was not a typical oven building material in other contemporaneous cultures in the surrounding areas. On the other hand, stone was used for the construction of fire installations (hearths) during the transformational Mesolithic-Neolithic and Mesolithic phases at Lepenski Vir. Strontium analyses have shown that the descendants of the local Mesolithic population and first-generation Neolithic migrants lived at Lepenski Vir during the Early Neolithic. The aim of this paper is to determine whether the “old” material used for the construction of a “new” type of fire installation at Lepenski Vir can be an evidence of contact between two communities with different traditions, forming a new type of material culture, unique to this site, which reflects the social relations in the settlement.

07 LIFEWAYS AND FOODWAYS IN THE BALKAN NEOLITHIC

Author(s): Ivanova, Maria (University of Heidelberg)

Presentation Format: Oral

The spread of pioneer farmers from the Aegean littoral into the sub-continental interior of the Balkans was accompanied by pronounced changes in lifestyle, including higher (probably seasonal) residential mobility, smaller community sizes, and a loss of sophistication in architecture and material culture – a phenomenon which has been designated by some authors as “the First Temperate Neolithic”. The adaptation of farming, and of the food system based on it, to new biogeographic conditions was a key component of this phenomenon. This adaptation involved not only preferences for particular plant and animal species, but also the specific cultural techniques of their use. The paper presents a synthesis of the results of the „Food Cultures“ research project, investigating the relationship between food and the expansion of farming in southeast Europe. It integrates the archaeological data with several further lines of macroscopic, microscopic, and isotopic evidence to reveal a wealth of complex food practices at different regional scales - from the cereal and meat consuming groups of the south to the dedicated milk consumers of the north, and the fish-loving farmers in the Danube gorges. The findings add substantially to our understanding of the „Mediterranean“ and „First Temperate“ farming strategies and foodways, providing direct evidence for latitudinal adjustments of herding practices, plant and animal food-

stuffs and food-related techniques across the Balkans and the adjacent Carpathian Basin.

08 REVEALING THE IMPORTANCE OF AQUATIC RESOURCES IN THE EARLY NEOLITHIC IRON GATES REGION THROUGH ABSORBED LIPID RESIDUES IN POTTERY

Author(s): Cramp, Lucy (University of Bristol)- Cramp, Lucy J E - Ethier, Jonathan - Urem-Kotsou, Dushka - Bonsall, Clive - Borić, Dušan - Broneant, Adina - Evershed, Richard P - Perić, Slaviša - Roffet-Salque, Mélanie - Whelton, Helen L - Ivanova, Maria (-)

Presentation Format: Oral

The Danubian Iron Gates, straddling the modern political border between Romania and Serbia, is a region of remarkable Late Mesolithic archaeology which also documents the appearance of early Neolithic cultural components as farming spread throughout the wider region. Stratigraphic uncertainties arising from the rescue excavations, which took place between the 1960s – mid-1980s, mean that much of the faunal evidence is considered unreliable. However, analysis of absorbed residues from the pottery provides an alternative proxy to determine the importance of different resources that were exploited by its users.

Our study has involved extraction of absorbed lipid residues from over 200 early Neolithic Starčevo pottery sherds from five different sites in the Lower Danube valley, including settlements at the foot of steep valley slopes in the upper Iron Gates gorges, through to the more open landscape downstream, where more realistic opportunities existed for farming. Our findings reveal that, in contrast with early Neolithic pottery of the same type from the wider Balkans region, and indeed from Neolithic pottery across Europe as a whole, these vessels were used considerably for processing aquatic resources. These findings suggest that the riverine resources from this unique cultural and environmental setting retained significant importance whilst farming dominated in the wider area.

09 UNSEEN SPACES – SYSTEMATIC REGIONAL SURVEY OF MICROREGIONAL NEOLITHIC SYSTEMS IN CENTRAL BALKANS

Author(s): Kocic, Miroslav (University of Pittsburgh)

Presentation Format: Oral

Anthropological archaeology has focused intently on the early emergence of sedentism and animal and plant domestication processes in many regions of the world. However, narratives about Neolithic Starčevo and Vinča cultures of Central Balkans have been stuck somewhere between migration or diffusion for longest time of the research history. Meta-narratives were defined by idea of „Neolithic package“ and process of Neolithization, overshadowing many of the questions concerning social organization. Recent scholarship has started to uncover large amount of evidence that the internal processes present far more complex organizational structure and local variants than previously thought. Onset of distinct change during the period of 6th and 5th millennia BC, such as possibly earliest extractive metalurgy (eg. Radivojević 2012), and evidence of presence of large systematic fortifications, present already in Early Vinča (~5400 BC) (Borić et al. forthcoming), raise questions about social organization of these groups.

This case study, a result of a NSF funded project “Domesticated Plants, Animals and the Emergence of Social Complexity” examines dynamics in the development of early village life in southeastern Europe during the 6th-5th millennia BCE on a regional level. Combining systematic pedestrian survey and statistically driven surface collection, with geophysical prospection was used to answer questions about intra-regional and settlement level organization of Neolithic population in Šumadija. Two interconnected systems set in Gruža valley around large diachronic Neolithic settlements of Grivac (~30ha) and Kusovac (~25ha) and their hinterlands, covering area of 110km² have been surveyed, uncovering specific forms of spatial organization and craft specialization and their change through time.

Boric et al. in press, Enclosing the Neolithic World: A Vinča Culture Enclosed and Fortified Settlement in the Balkans, *Current Anthropology*

Radivojevic, M. (2012). On the origins of metallurgy in Europe: metal production in the Vinca Culture (Doctoral dissertation, UCL (University College London)).

10 INVESTIGATING THE CONTEXTS OF FOOD GRINDING PRACTICES AND TOOLS IN THE NEOLITHIC OF SOUTHEASTERN EUROPE

Author(s): Bekiaris, Tasos - Chondrou, Danaï - Ninou, Ismini - Valamoti, Soutana Maria (Aristotle University of Thessaloniki)

Presentation Format: Oral

Ground stone technology and especially food processing tools have so far demonstrated their potentials in the approach of the subsistence strategies of prehistoric societies. Grinding stone tools, such as grinding slabs and grinders, are considered to be indispensable elements of the “Neolithic Package”, while their technomorphological features (i.e. raw materials, sizes, workface configuration), as well as their patterns of use and disposition, are crucial for understanding the economic significance and social meaning of these artifacts for the neolithic communities. As part of the PLANTCULT project (ERC Consolidator Grant-Horizon 2020), an extensive bibliographic research is ongoing, focusing on the published data that could contribute to the thorough examination of grinding stone technology in Greece, the Balkans and Central Europe during the Neolithic and the Bronze Age. The aim is to map the changes and similarities of the grinding tools in prehistoric space and time and to approach the modes of food processing technologies and habits within the constantly changing prehistoric social life.

This paper examines the spatial contexts in which the consumption of the food grinding equipment occurs throughout the Neolithic

of Southeastern Europe. Following both a regional, but also a micro-scale perspective, the aim is to investigate how grinding technology is organized and practiced within different site-types (i.e. extended settlements, tell settlements, cave sites) but also within different activity areas in the build environment of the neolithic communities (i.e. houses, open areas, pits, ditches). The goal is to investigate possible changes and similarities in the spatial arrangement of the grinding practices that could signify differentiation in the economic behavior and social expression of the neolithic societies.

11 TRACING REGIONAL VARIATION AMONG AEGEAN NEOLITHIC CELT ASSEMBLAGES

Author(s): Stroulia, Anna (University of Southern Indiana)

Presentation Format: Oral

For a long time, macrolithics (also known as ground stone tools) represented one of the most neglected materials of Neolithic Greece. Recently, however, the field has witnessed a dramatic growth and significant progress has been made in understanding the processes through which these tools were produced, used, and discarded. Indeed, one particular macrolithic type, celts, have been studied intensively enough to allow us to trace not only general patterns but also broad regional variations. This paper draws from published and unpublished data on more than 20 assemblages from different parts of the Aegean. In the first part of the paper, I take a panoramic view, approach Greece as a whole, and examine differences between northern and southern celt industries in terms of tool sizes and types as well as manufacturing techniques. These differences are placed in a wider context by discussing other aspects of the archaeological record (e.g., botanical remains, figurines, and settlement patterns) that exhibit a comparable geographic variation. In the second part of the paper, I shift my perspective as I zoom in on a specific region of northern Greece (the prefecture of Kozani) to compare morphological and technological characteristics of celts from sites in two different areas.

12 BETWEEN LITHICS AND MACROLITHICS: FLAKES AND FLAKED STONES OF LIMESTONE AND GABBRO FROM VAREMENI GOULON, NORTHERN GREECE

Author(s): Kakavakis, Odysseas (Ephorate of Antiquities of West Attica, Piraeus and Islands) - Stroulia, Anna (University of Southern Indiana)

Presentation Format: Oral

In the Aegean, as elsewhere, lithics (or chipped stone tools) and macrolithics (also known as ground stone tools) have been traditionally approached as two separate technological systems that involved: distinct raw materials (e.g., chert and obsidian vs. serpentine, sandstone, gabbro, and limestone); distinct manufacturing techniques and operational sequences (e.g., percussion and pressure flaking vs. pecking and grinding); and implements of distinct morphological and functional characteristics (e.g., flakes and blades vs. celts, grinding tools, and hammers). They have also been studied by two different types of experts. The small assemblage from the Neolithic site of Varemni Goulon in northern Greece, presented in this paper, defies these simple distinctions: it comprises implements typically classified as lithics (flakes and flaked stones) which, nevertheless, are of raw materials typically employed for macrolithics (gabbro and limestone). This paper brings together a lithic and a macrolithic expert (a first in Aegean stone tool studies) to: 1) present the characteristics of the assemblage; 2) discuss who was involved in the production of this material; 3) examine why limestone and gabbro of fairly good flaking quality were not employed more often for lithic tools, although these stones were available at the nearby river along with chert pebbles and cobbles.

467 DISASTER-LED ARCHAEOLOGY: ANTICIPATIONS AND RESPONSES TO HERITAGE-IMPACTING CATASTROPHES

Theme: Theories and methods in archaeological sciences

Organisers: Schlanger, Nathan (Ecole nationale des chartes, Paris; UMR 8215 Trajectoires - CNRS, Paris 1, Nanterre) - Okamura, Katsuyuki (Osaka City Cultural Properties Association) - Nespoulous, Laurent (INALCO, Paris; UMR 8215 Trajectoires - CNRS, Paris 1, Nanterre)

Format: Regular session

Disasters come in all sorts and shapes, with all kinds of agencies and implications. Catastrophic natural events are of course constitutive of the geological and climatic history of the earth, but they become hazards and risks, to be endured, mitigated or avoided, with the emergence of human civilisation – civilisation which itself generates or exacerbates its own array of mishaps. Recent events have shown that “natural” and “human-induced” disasters can be considered together – Haiti, Fukushima, Kathmandu, Marche, Mexico, as well as Chernobyl, Fukushima (again), Bamyán, Palmyra etc. Not all that is sudden or spectacular is also unexpected, let alone unavoidable: lack of anticipation, poor planning and short term considerations are rife. If flash-flooding and seismicity can benefit from avoidance measures, why not iconoclasm and vandalism? The demarcation between nature and culture, between engineering and politics, is never straightforward, including on matters of archaeology and cultural heritage. We seek here to encourage discussions, enriched by testimonies and case studies, around disaster-led archaeology.

Some questions:

- How can processes of preparation and prevention benefit from previous experiences?
- How can archaeological damage and heritage loss be included in processes of reconstruction?
- How – and why – to fight or delay the inevitable ruin and erosion of matter and of authenticity?

We look forwards to fruitful exchanges between colleagues with specific experiences from across the world (Far East, Mediterranean) also between more empirically grounded and more theoretical colleagues.

ABSTRACTS

01 DEALING WITH DISASTER OF THE PAST, IN THE PAST, PRESENT AND FUTURE : SISYPHE, GET THEE OUT!

Author(s): Nespoulous, Laurent (INALCO)

Presentation Format: Oral

Japan has a long history of addressing the past and its tangible remains. From the chronicles of Antiquity (VIIIth-XIIIth centuries) to the scholars of the Edo period (XVIIth-XIXth centuries) and then to the different time-scales of the Modern era, every period shows a distinctive approach towards the material remains of the past, and each deploys its own “technologies of vestiges”, including practices, rules, laws or institutions. The same applies to its very long, very well documented history of natural disasters. And yet, in a country so regularly stricken by floods, deluge of rain, extreme winds, earthquakes, tsunamis, landslides and volcanic eruptions, the problem on how to make sure that previous knowledge about these events can actually count shows up very often. This is of course not a “Japanese issue” per se. However, Japan being a very well equipped land, with, from highest Antiquity, a quasi systematic approach of recording the catastrophes falling upon its inhabitants, it is of paramount importance to understand why and how parts of very valuable available knowledge, documented both by historical records and recent archaeological research (Japanese preventive archaeology being one of, if not the most active of its kind), tend to eventually slip into the void, only to resurge when a new disaster strikes again.

02 TACKLING AN UNPREDICTABLE FUTURE; THE DEVELOPMENT OF A DISASTER-LED ARCHAEOLOGY IN JAPAN

Author(s): Okamura, Katsuyuki (Osaka City Cultural Properties Association)

Presentation Format: Oral

The recent large-scale earthquake in Kumamoto, which caused extensive damage to cultural heritage including castles, temples and shrines. Now, as happened previously in Kobe and Tohoku, the effects of the quake are having an impact on underground archaeological heritage as well. Japan has suffered at least three severe earthquakes in the past two decades, and regrettably a number of seismologists and geologists predict another quake within several decades.

Since the Great East Japan Earthquake of 2011, archaeologists have been faced with a number of post-disaster challenges in both archaeological studies and heritage issues; 1) rescuing heritage, 2) reconstructing community heritage, 3) managing and/or operating intensive rescue excavation prior to reconstruction development, 4) investigating traces of past disasters during excavation and 5) coping with the creation of new heritage (memorial monuments). These five topics are closely associated with each other, and were often discussed together during strategy meetings for the future of the affected communities. It is with this in mind that we propose the need for a disaster-led archaeology.

Disaster-led archaeology would, by necessity, be a fatalistic subject, and should be considered as a kind of ‘public archaeology’ which works towards disaster prevention and risk management for archaeologists living in earthquake prone countries like Japan. The discipline would be a new archaeological field with an interdisciplinary and international character. Bringing this new field of archaeology about will no doubt be very challenging, however, it would also be an opportunity to promote several aspects of contemporary archaeologies.

This paper will review the impact of disasters on Japanese archaeology and heritage management since 1995, and explore the challenges and perspectives of disaster-led archaeology based on cases from Japan, with a desire to promote cooperation beyond just countries and regions.

03 FUKUSHIMA TODAY: SEVEN YEARS SINCE THE GREAT EAST JAPAN EARTHQUAKE AND THE FUKUSHIMA DIIICHI NUCLEAR POWER PLANT ACCIDENT

Author(s): Kikuchi, Yoshio (Fukushima University)

Presentation Format: Oral

The earthquake and the nuclear accident that occurred on March 2011 seriously damaged the archaeology and cultural heritage in Fukushima Prefecture. In the evacuated zone along the coastal areas, a great many natural heritage sites, along with cultural artifacts at museums and elsewhere had to be left immediately; their rescue and preservation began afterwards. Now, those critical activities have almost concluded, but other problems have developed, namely: how should we preserve the local heritage and return

artifacts to the former places?

The Japanese government has gradually been allowing access to damaged areas since 2014, and the evacuated zone currently stands at about one third of what it was in 2011, but few inhabitants have returned to the hometowns. In the meantime, some local governments within the formerly evacuated zones have organized a new body to preserve heritage that have not been well-known, in addition to enacting new local regulations to preserve all heritage. Their actions have begun to affect people in their localities and researchers in the Japanese academic world.

Government excavations were carried out in coastal areas until around 2016 in the course of restoring public infrastructure. More recently, private sector developments, mainly involving the construction of solar power plants and other facilities are on the rise, and staff of local governments have had many the excavation work. In the near future, further excavations in preparation for storing contaminated earth will occur next to the Fukushima Daiichi Power Plant.

As stated above, activities involving the archaeology and preservation of heritage in areas affected by the earthquake and the nuclear accident will continue in new and different forms, and we cannot necessarily predict how the situation will be altered in the near future.

I'll introduce recent excavation- and heritage-related activities, talk about residents' situations, problems and perspectives.

04 THE EARTHQUAKE DISASTERS OF CHRISTCHURCH AND THEIR IMPACT ON LOCAL ARCHAEOLOGY

Author(s): Schwenzler, Gerit (-)

Presentation Format: Oral

Archaeology about modern times covers round about the last 400 years. We think about European archaeology, of course, but also of Asian and American (North and South) archaeology. Sort of forgotten lies the Archaeology of Oceania – Australia and New Zealand, especially in regard of European settlement, since “modern” history of those countries is so very young. Nevertheless, there is archaeology of early European settlement as well as traces of Maori activity to find. Due to the recent earthquake catastrophes in 2010 and 2011, and again in 2016, the city of Christchurch on the Southern Island of New Zealand had to suffer collapsing buildings and mass demolitions. As a result, it is the archaeologists' task to document demolitions of buildings built prior to 1900 and check underneath modern foundations what may have been hidden for a couple of centuries. There we find the remnants of European immigration to New Zealand in the 19th century, which in turn connects the present-day societies with a shared history. The paper shall present the work of the archaeologists in Christchurch after the Earthquakes where archaeological observation was part of the demolition programme. An insight shall be given to the background that led to the archaeological fieldwork in Christchurch which is still active to date.

05 RECENT UNITED STATES FEDERAL GOVERNMENT HURRICANE DISASTER RESPONSE IN THE CARIBBEAN: CASE STUDIES OF EFFECTIVE HERITAGE MANAGEMENT

Author(s): Bello, Charles (U.S. Federal Emergency Management Agency)

Presentation Format: Oral

The impact of unexpected and severe weather events on historic properties is well-known throughout the Caribbean. Hurricanes are destructive. Hurricanes hitting tropical islands where infrastructure is less well developed and fragile are even more destructive. The back to back (and rare) Category 5/high-end Category 4 hurricanes (Irma and Maria) that hit the Commonwealth of Puerto Rico and the U.S. Virgin Islands this past September wreaked havoc in an unprecedented powerful and punishing fashion. Winds related to the Cape Verde-type Hurricane Maria (one of the most powerful Atlantic Ocean storms in recorded history) reached sustained levels of ca. 155 mph before many recording instruments were damaged. Rain amounts were staggering, and combined with incredibly high winds, severely damaged roads, structures, infrastructure, and beaches. Sad to consider, but Hurricane Maria finished the devastating punch brought on by the Hurricane Irma only two weeks earlier. Territorial governments were clearly challenged when addressing such concerns – from a practical as well as financial perspective. However, adverse effects to heritage properties resulting from disasters can be mitigated by government agency collaboration. This presentation focuses on recent work between the United States Federal Emergency Management Agency and various offices of the Territorial governments of the Virgin Islands and Puerto Rico to protect historic resources during repair of residential properties and public infrastructure damaged in the fall of 2017. This Federal/Territorial partnership focused on employing creative measures of heritage management throughout this hard-hit part of the multi-cultural Caribbean. The successful work stands as a positive indicator of the importance that Territorial and Federal governments each place on historic preservation in a unique and fragile environment and economy.

06 A RUSSIAN VIEWPOINT ON NATURAL DISASTERS AND CATASTROPHES IN RUSSIA

Author(s): Mokrousov, Sergey - Engovatova, Asya (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

Russian history offers many opportunities to discuss the topics of natural disaster and catastrophe. During the last century Russia's archaeological heritage has encountered many instances of war, earthquake and flooding. In the second half of the 1990s – and the beginning of the 2000s the military conflict in Chechnya caused almost all the documents and collections of many years of archaeological investigations in the region to becomelost. Due to the system of the obligatory filing of reports on archaeological fieldwork

- established by State Cultural Law, and of documents on archaeological sites (so-called "archaeological passports"), in the keeping of Institute of Archeology RAS (Moscow) (IA RAS) - it has been possible to re-establish Chechnya's archaeological archive. One more aspect should be noted - with the assistance of the IA RAS, nowadays the region in question is the area of legal archaeological works carried out by professional archeologists. Finds obtained are included in the State Museum Fund of Russia Federation. Three years ago, the Far Eastern Region of Russia suffered catastrophic and atypical flooding, which damaged or destroyed hundreds of archaeological sites. Within the framework of the State Program "The Culture of Russia", under the State Ministry of Culture large-scale activities have been undertaken (both surveys and excavations) in all Russia's Far Eastern regions, which allowed for re-establishing stability in the Region, as well as suggesting measures for protecting archaeological objects. One of these - a unique complex of rock carved images of Sicatchi Alian, is being studied by the IA RAS. We should also note the State system for permanent monitoring of archaeological objects, aimed at recording their preservation and undertaking rescue activities if necessary. Such works are carried out in all Russia regions according to the State Law.

07 WHEN CLOCKS STAND STILL AND BELLS ARE SILENT: EXPLORING HERITAGE TIME IN THE AFTERMATH OF DESTRUCTION AND LOSS

Author(s): Di Giuseppantonio Di Franco, Paola (University of Essex; University of Cambridge) - Viejo-Rose, Dacia (University of Cambridge) **6**moment frozen in time, preserved snow-globe like and transmitted unchanged, such a central heritage value? In pursuit of these questions we will draw on empirical material from cases in which there has been a particularly dramatic rupture indicating a marked 'before and after'. Looking at cases of sudden and dramatic destruction we will show how societies thus affected approach time, and the rupture in continuity. From the cracked bells of Philadelphia, Lubeck and Amatrice, the stopped clocks in Hiroshima and numerous towns in Italy, timepieces that have been stilled as a result of the destruction wrought by war or natural disasters have been used as memorials to mark said events. Do they mark rupture or new beginnings? Do they mark the moment when one progression in time ended and another began? Are they markers of mourning for what was lost or reminders of what might happen again? Through this close examination of the liminality between change and continuity we seek to elucidate the relationship between heritage and loss.

a. UNESCO CHAIR ON HERITAGE FUTURES AT LINNAEUS UNIVERSITY

Author(s): Högberg, Anders - Holtorf, Cornelius (Linnaeus University)

Presentation Format: Poster

A UNESCO Chair on Heritage Futures was created in September 2017 at Linnaeus University in Kalmar, Sweden. It is often said that heritage is to be conserved for the benefit of future generations. The UNESCO Chair on Heritage Futures investigates what this may mean in the context of the inherent uncertainty of the future on the one hand and practices associated with different kinds of heritage on the other hand. Some research and related activities of the Chair are funded as part of the AHRC funded Heritage Futures project based at University College London and directed by Professor Rodney Harrison.

How is the future being made through the 1972 World Heritage Convention, reconstructions of lost heritage, final repositories of nuclear waste, or the design of a message for the New Horizons spacecraft? When are the futures these practices work towards? How can we best determine what will benefit relevant future generations? What is the actual legacy we will leave behind? The Chair will support heritage practitioners in finding answers to these questions and in developing their own professional strategies for the future. In this way it will support heritage practitioners in working with cultural heritage for the future. Which future (or futures) is heritage for, what will benefit future generations, and how can the answers to these questions be applied to contemporary heritage practices?

This poster presents the UNESCO Chair on Heritage Futures at Linnaeus University and how it will work in practice.

477 THE ARCHAEOLOGY OF CLIMATE CHANGE IN THE PAST AND PRESENT

Theme: Theories and methods in archaeological sciences

Organisers: Biehl, Peter F (University at Buffalo, SUNY) - Hritz, Carrie (University of Maryland) - Vandrup Martens, Vibeke (NIKU - Norwegian Institute for Cultural Heritage Research) - Rockman, Marcy (National Park Service)

Format: Regular session

The archaeology of climate change is still a desideratum in current scientific and political debates on this hot topic. Our data is showing that climate change presents an array of challenges for archaeology and heritage - from loss from erosion, fires, sea level rise, to disconnection due to migration and loss of contact of affiliated communities, and damage deriving from conflict and other social changes. This session brings together viewpoints from the local to global scale, projects completed and in progress, to share the current scope and state of the heritage and climate research asking key questions such as where are we in connecting the past to efforts to address climate change? Where do we stand in engaging heritage and archaeology with climate policy, adaptation planning, community engagement, and to climate and migration solutions? This session is the second part of an EAA-SAA collaboration with the first session at the SAA in Washington DC in April 2018. It

is also connected with the newly established EAA Community on Climate Change and Heritage (CCH) and invites speakers to discuss ways to translate fundamental archaeological research into actionable science to inform decision making as well as monitor climate change as it relates to archaeology and heritage from in situ preservation to modelling, sustainable mitigation strategies and systems for site evaluation as well as trans-disciplinary examples of engaging with climate change from research design to outreach in museums and the public domain.

ABSTRACTS

01 WEATHERING THE STORM: CONTEMPORARY ANALOGIES FOR PAST CLIMATES

Author(s): Griffiths, Seren (UCLan) - Gearey, Ben (UCC)

Presentation Format: Oral

Climate change and archaeology has become an increasingly “hot” topic in recent years, with the impacts of climate change on archaeological sites especially important in understanding the archaeological evidence. Evidence for climate change in the present provides an important analogy for the interpretation of multi-proxy palaeoenvironmental data from past environments; contemporary analogies are particularly important in terms of how much local sequences with evidence for environmental change represent wide-spread, long-term “climate change”, or how much do these represent highly-specific “local” responses or even individual weather events? How we interpret palaeoclimate datasets has important implications for the kinds of explanatory narratives archaeologists invoke, whether and how we can cope with noise in our data, whether we inadvertently apply linear directional narratives, whether we can cope with variation in succession between different sequences and regions, and whether we can account for human resilience to both climate change and individual weather events. Using a series of examples from Holocene north-west Europe this paper examines how archaeologists and palaeoclimatologists have approached the evidence for environments in the past, and how these approaches can help inform contemporary climate change debates. These case studies will include multi-proxy evidence for different environmental changes, human-environment interaction, and will address the challenge of including multiple noisy datasets.

02 THE EFFECTS OF VERY SHORT CLIMATE ANOMALIES ON THE IDENTITY DIVERSITY OF EARLY FARMING GROUPS

Author(s): Gronenborn, Detlef (Roemisch-Germanisches Zentralmuseum, Mainz; Johannes-Gutenberg University, Mainz) - Wirtz, Kai (Institute for Coastal Research Helmholtz-Zentrum Geesthacht) - Strien, Hans-Christoph (Johannes-Gutenberg-University) - Lemmen, Carsten (Institute for Coastal Research Helmholtz-Zentrum Geesthacht)

Presentation Format: Oral

Using an example from western Central Europe, the possible effect of very short climate anomalies on what is interpreted as identity diversity dynamics among early farming populations is discussed. It appears that such climate extremes, like droughts, had a forcing effect on already existing tendencies to socially more rigid societies. This rigidity might find its expression in an increase in interpersonal violence, and communal building activities. Possibly, these cycles of identity diversity constituted a forcing factor for the long-term dynamics of the Neolithic and may equally at least partially explain the observed population dynamics.

Three population cycles from the Early to Young Neolithic in western Central Europe are used as an example. These constitute a trajectory from simple farming societies with lineage-based social structures but little political hierarchies to societies of the Young Neolithic with, albeit ephemeral, indications for hierarchical structures, at least from the settlement data and also from burials and recent DNA analyses. Although these three periods and cycles (Early Neolithic – Middle Neolithic – Young Neolithic) probably represent rather different social, political and economic structures and forms of organization, they appear to have undergone repeated cyclical dynamics. All three cycles and especially their termination display a sensitivity to climatic changes.

03 ARCHAEOLOGY OF THE CORE, AND MORE: HOW THE HOLOCENE MARINE TRANSGRESSION AFFECTED THE PREHISTORIC POPULATION IN THE ADRIATIC BASIN

Author(s): Jerbic, Katarina (Flinders University, Adelaide)

Presentation Format: Oral

This paper will provide an archaeological perspective for the climatic changes that occurred after the LGM, focusing on a case study in Zambrotija Bay, Croatia. The site was initially recognised in 2008 as hundreds of wooden piles protruding out of the seabed, and a peat platform, both of which lay 3m below MSL on the ridges of a submerged sinkhole. Prehistoric pottery, stone artefacts, zoological and botanical remains were found scattered around the area, making it evident that the site represents a unique opportunity for investigating the part of Mediterranean Prehistory “lost” due to the Holocene marine transgression and landscape evolution. Between 2008 and 2014, a few investigations were performed on site, including a bathymetric survey as well as underwater archaeological excavations. The presence of wooden piles, one of which revealed a radiocarbon age of 4230–3980 cal BC, together with peat and Prehistoric finds typologically attributed to the Copper Age, indicated a connection to the well-known Prehistoric pile-dwellings of the Alpine lakes. In 2017, a series of collaborative investigations were conducted on site, for the purposes of the author’s PhD research project in underwater archaeology at Flinders University in Adelaide, South Australia. The methods used in this campaign (geological coring and underwater archaeological research) were chosen to contribute to the understanding of the chronology, pal-

aeoenvironment, and cultural connections in the post-Neolithic Mediterranean, through the theoretical lens of Climate Change Archaeology. In this paper, the author will explain how these methods contributed to the understanding of the adaptive pathways of the Prehistoric population in preserving sustainability in the time of rapid environmental changes, endorsing archaeology into being an equal contributor in modern climate change debates. The research was done in collaboration with the local community, supported by the local Archaeological Museum in Pula, and other Croatian and international institutions.

04 ADAPTATIONS TO LIFE IN A SALT MARSH AREA: THE COASTAL AREA OF THE NORTHERN NETHERLANDS FROM 650 BC

Author(s): Nieuwhof, Annet (University of Groningen)

Presentation Format: Oral

The archaeology of the northern Netherlands has a long history of research into the relationship between habitation and the dynamic coastal landscape. Possibly owing to its early head start, this research has for a long time been considered complete, and of merely regional significance. However, it has much to offer in the present debate on adaptive pathways in low-lying coastal regions that are facing frequent flooding. Recent archaeological research has revealed many details on the strategies of the inhabitants of this region in coping with their natural environment. These strategies may have far wider applications and deserve to be brought into the open. The case of the northern Netherlands shows that new questions in archaeological research may provide useful answers to present challenges.

This paper will present an overview of the habitation history of the coastal area of the northern Netherlands, focusing on adaptation strategies. Before medieval dike building, this was a regularly inundated, open salt marsh area. It owed its existence to a continuing relative sea-level rise due to isostatic subsidence, combined with a sufficient supply of sediment. Despite frequent inundations, the area was inhabited since around 650 BC. That was only possible because the inhabitants built their houses on terps: artificial dwelling mounds, carefully constructed out of local materials. Many terps started as small platforms, and developed over time into small hills, up to over 8 m high and covering areas of 15 ha or more. Terp habitation was successful and could have continued, were it not for the considerable subsidence of inland areas due to peat reclamation. That made the entire coastal area vulnerable to the sea. Building dikes became inevitable in the 11th or 12th century. The technology of terp building, however, may still be of use.

05 IN VINO HEREDITAS: EXPLORING CLIMATE COMMUNICATION AND MITIGATION THROUGH VINEYARD LANDSCAPES

Author(s): Lafrenz Samuels, Kathryn (University of Maryland) - Samuels, Joshua (The Catholic University of America)

Presentation Format: Oral

Archaeological research on climate change—whether working on past climate change or the current/future impacts of climate change to archaeological resources—has been primarily concerned with questions of adaptation. Less attention has been paid to the capacity for archaeological and other heritage resources to mobilize social change for mitigation efforts. We examine the case of cultural landscape properties inscribed to the UNESCO World Heritage List. With widespread public recognition as a vehicle for globally-minded conservation, the “branding” function of World Heritage offers a valuable platform for public dialogue on climate change. Moreover, cultural landscape properties are particularly well-suited to climate communication as they celebrate the joint natural-cultural character of heritage resources. As of 2017, there have been 103 sites inscribed to the World Heritage List as cultural landscapes, primarily as “organically evolved landscapes” for the designation and protection of agrarian heritage and agrobiodiversity. Of these, vineyard landscapes are the best-represented, and they offer valuable opportunities for drawing attention to climate change already underway.

In addition to being an agricultural resource beloved by many, viticulture is at the frontline in witnessing the impacts of climate change to agricultural production, being particularly vulnerable to climate change. Drawing on our fieldwork, employing archaeological ethnography in Italy (Sicily and the Piedmont region), we discuss the impacts of climate change on vineyard landscapes in Italy, and their potential to raise awareness for the need for climate mitigation. The wine industry in Europe is predicted to be hit particularly hard compared to other wine regions in the world. The suitability of cultivation for present grape varieties is expected to shift to higher latitudes and altitudes, a change that strikes a blow to the heart of the concept of terroir, a concept that specifically characterizes the European wine-making tradition.

06 PAST AND FUTURE RESPONSES TO ENSO IN PERU'S CHICAMA VALLEY: MAPPING DISASTER AND MITIGATION WITH ARCHAEOLOGY AND REMOTE SENSING

Author(s): Vining, Benjamin (University of Arkansas)

Presentation Format: Oral

Episodic climatic perturbations like the el Niño Southern Oscillation (ENSO) have long been linked with disastrous environmental events and social collapse. Integrating archaeology with climatic and palaeoclimatic clarifies the relationships between environmental disasters and social responses, both to understand past events as well as to anticipate the impacts of future ones in increasingly unstable climates.

During 2016 – 2017, a strong ENSO warm phase struck Peru's north coast. Remote sensing combined reveals the extent of disasters

associated with this event and their effect on modern communities. These effects were spatially-heterogeneous effects. Flash flooding and mass wasting occurred in the main portions of the Chicama Valley, affecting irrigation intakes, fields, and monumental sites. However, rainfall along the desert margins led to localized groundwater features. Comparison of these data with archaeological settlement patterns, however, reveals that different agricultural production strategies were used in various portions of the valley: large-systems infrastructure such as canal-fed irrigation agriculture was used in portions of the valley that were vulnerable to mass wasting. In contrast, small spring- and well-fed agriculture was practiced in the desert margins. Sites in the Pampa Mocan and similar areas indicate they were cultivated in the past. Ephemeral groundwater in the past may have enabled opportunistic but small scale agriculture, buffering risk to larger, centralized productive systems.

This has important implications for environmental disaster not being an all-or-nothing proposition, but affecting different socio-economic elements variably. These results have implications not only for heritage preservation in the events of extreme climatic events, but suggest that past land use evidenced in archaeological sites can inform future mitigation strategies in response to climatic perturbations.

07 CULTURAL HERITAGE AND CHALLENGES AUGMENTED BY CLIMATE CHANGE: RESULTS FROM THE H2020 EU-STORM PROJECT

Author(s): Williamson, Robert (Mellor Archaeological Trust; University of Salford) - Thompson, Adam (University of Salford) - Wit, Rosmarie - Žuvela-Aloise, Maja (Zentralanstalt für Meteorologie und Geodynamik - ZAMG)

Presentation Format: Oral

Hazards and threats augmented by climate change are some of the greatest challenges that owners and stakeholders of cultural heritage assets will face in the coming century. The EU-STORM (Safeguarding Cultural Heritage through Technical and Organisational Resources Management) project, co-funded by Horizon2020, aims to help stakeholders safeguard cultural heritage across Europe from climate-driven meteorological hazards as well as natural disasters. Cultural heritage across Europe is some of the richest in the world, accounting for a large proportion of Europe's economy through tourism related activities. It is vital, therefore, that owners of cultural heritage assets are informed of potential change, and advised on preservation and protection of their assets. The Mellor Heritage Project is one of five pilot sites within the EU-STORM Project. Mellor, Greater Manchester is located in the North-West Region of the UK and is comprised of three sites: Shaw Cairn, a Bronze-Age burial site, where finds include: flints, pottery and cremated bones; Mellor Hilltop, which encompassed an Iron-Age settlement; and Mellor Mill, the remains of an industrial Mill, built by Samuel Oldknow in the 1790s and subsequently burnt down in 1892. Mellor has employed a range of different methods and techniques for monitoring meteorological and biological hazards and their effects. These included a range of weather and environmental sensors to monitor weather events, as well as terrestrial laser scanning, SfM photogrammetry and aerial spectral photography to monitor structures and materials. Climate change analysis has been conducted for the region and shows that air temperature will increase from the 1971-2000 baseline by the middle of the century, with a 65% increase in summer days. No clear indication could be given for precipitation in the region, but interestingly it is predicted that there will be a reduction in freeze-thaw days, by up to a half, for the same time period.

08 WHAT CAN ERODING COASTAL HERITAGE DO FOR CLIMATE CHANGE RESEARCH? RESULTS AND INSIGHTS FROM SCOTLAND'S COASTAL HERITAGE AT RISK

Author(s): Hambly, Joanna - Dawson, Tom - Graham, Ellie (University of St Andrews; The SCAPE Trust)

Presentation Format: Oral

Between 2012 and 2016, as part of the Scotland's Coastal Heritage at Risk Project (SCHARP), the SCAPE Trust worked with around 400 volunteers to carry out a national survey of coastal archaeological heritage threatened by erosion. The survey built upon 20 years of coastal zone assessment survey in Scotland, covering around 35% of Scotland's 16,000km long coastline. The purpose of the survey was to gain a national snapshot of the state of the threatened coastal heritage resource, and review the priority status of coastal sites at risk previously identified through a desk-based analysis of data gathered through professional coastal surveys. The SCHARP survey has resulted in a prioritised list of the most significant and the most vulnerable coastal archaeological sites within the survey areas. These can be referred to with confidence by heritage managers for strategic planning and resource allocation, and by academic and local communities as a valuable research and learning resource. In this paper we will present and evaluate our results and discuss two important outcomes of the project. The first is the value of long-term empirical data collection in documenting wider trends of coastal change affecting archaeological heritage; and the potential of using this approach to research the effect of a changing climate upon coastal processes going forward. The second is an assessment of the value of involving volunteers in the research. Volunteers significantly increased our capacity to carry out repeated largescale monitoring and recording of archaeological heritage impacted by erosive processes. The project has resulted in a productive research collaboration between local volunteers and archaeologists; laying the groundwork for improved understanding of the effects of climate change at our coasts across all sections of the community.

09 FAR SIGHT: CONTRIBUTING TO RESILIENT COMMUNITIES IN THE FACE OF CLIMATE CHANGE.

Author(s): Gibson, Julie (University of Highlands and Islands; Orkney Islands Council) - Downes, Jane - Mainland, Ingrid - Keir, Alison (University of Highlands and Islands)

Presentation Format: Oral

It is now accepted that archaeology has the potential to play a wider role within political and social agendas on climate change. In this paper we will examine the potential of responses to archaeological sites being eroded by the sea to not only contribute to wider climate change mitigation and policy, but to meet the 'grand challenge' or high ambition to effect behavioural change more widely.

To explore this we focus on small islands' communities, and their sustainability past and present. Small island communities and their landscape heritage can be seen as 'canaries in the coal mine' in regard to multi-faceted impacts of climate change; amongst other effects, for example, the Scottish Orcadian archipelago is losing a third of its archaeological heritage to coastal erosion. In the case studies touched upon (including in Easter Island and the Cook Islands), archaeologists engage intensively and in a sustained manner with communities. The inevitability of increasing erosion and the need for adaptive heritage management strategies and mitigation is confronted.

Examining a range of coastal archaeology projects, we propose interdisciplinary and creative methods for engaging wider audiences and raising wider awareness of climate change through research and excavation. We also connect with ways of utilising eroding heritage research within Education for Sustainability (Efs, or LfS). While archaeology has great potential within this area, we will argue that to make a positive contribution - to Efs, climate change policy, or to behavioural change -there is a need to evaluate the contribution we make in effecting climate change literacy through our research and practice.

10 THE IMPORTANCE OF HISTORICAL MAPS AND CULTURAL HERITAGE FOR MODERN CLIMATE ADAPTATION STRATEGIES

Author(s): Vreenegoor, Ellen - Bruijn, Gerda (Cultural Heritage Agency of the Netherlands)

Presentation Format: Oral

The Netherlands are part of the Rhine-Meuse-Scheldt delta. The majority of the country is low lying and thus prone to flooding. That is the reason why the Netherlands has a long tradition of water management.

The National Public Works Agency of road and water management (Ministry of Infrastructure and Water) and the water boards try to create extra space for the rivers and streams, but also try to get rid of too much water as soon as possible. That means that along the rivers all trees and shrubberies have to move to lead the water through. And in smaller streams all remains of watermills, locks and shacks have to be removed for the same purpose.

If we look closer to the historical water systems these elements are situated most of the time at the best places in de river or stream. We study the possibilities to re-use that systems and elements for storing water in periods of too much water (flooding)so we can re-use it in dry periods.

We make analyses using historical maps to understand the water system and the changes made through the centuries. With this historical knowledge we can find new solutions for current and future problems with water .

11 "PLEASE INTEGRATE THE PAST HERE": SUCCESSES, FAILURES, AND RECOMMENDATIONS FROM A YEAR OF REVIEWING CLIMATE DOCUMENTS AS AN ARCHAEOLOGIST

Author(s): Rockman, Marcy (US National Park Service)

Presentation Format: Oral

Reports of the Intergovernmental Panel on Climate Change (IPCC) and the US National Climate Assessment are substantial and highly consequential climate change documents at a global scale. If the effects of climate change on archaeology and all of cultural heritage and the capacity to learn from archaeology and heritage about how human societies might better adapt to climate change into the future are going to be fully recognized and engaged in the global response to climate change, these two topics should clearly be part of documents from these two sources. Unfortunately, reviews and submission of comments for several of these documents over the past year has shown this to not yet be the case. This paper overviews how archaeology and cultural heritage is being represented in these documents, which types of comments have been successful and which have not, and recommendations for next steps. Immediate key steps for the archaeological community include: to continue to nominate archaeologists to scope and write these reports, to review these documents to identify and highlight archaeological gaps, and to recommend specific references and scholars to address those gaps. Longer-term tasks include assessment of how human behavior and society at large are currently presented in these documents, and how archaeology can research, publish, and communicate its work in ways that can directly address and improve them.

12 TRACKING CLIMATE CHANGE IMPACTS TO A 19TH CENTURY MINORCAN WELL THROUGH CITIZEN SCIENCE

Author(s): Miller, Sarah - Murray, Emily Jane (Florida Public Archaeology Network)

Presentation Format: Oral

Climate Change impacts and coastal dynamics are affecting thousands of cultural resources across Florida, USA. Continuous monitoring of these sites has proven the best strategy to record changes, learn more about sites themselves and aid in management decisions. However, the state has lacked a clear method for systematic monitoring. In 2016, the Florida Public Archaeology Network (FPAN) started Heritage Monitoring Scouts (HMS Florida) to engage the public in addressing these issues and provide a platform for collecting monitoring information. The citizen science program trains volunteers to monitor sites throughout the state to collect baseline data and document changes at archaeological sites, historic cemeteries, shipwrecks and other historic resources.

One such site, Shell Bluff Landing (8SJ32), was the focus of a pilot program in partnership with the GTM Research Reserve in Ponte Vedra Beach, Florida. The site contains a dense coastal shell midden with occupation spanning 6,000 years and a coquina stone well built around 1800. The site faces climate change impacts and threats from coastal dynamics that include salt water intrusion, flooding, and, most notably, erosion exacerbated by wave action from the Intracoastal Waterway. Since Shell Bluff Landing was acquired by the State of Florida in the 1980s, land managers employed numerous strategies to manage and track the erosion at the site. However, these efforts have proven largely unsuccessful. Through the HMS Florida pilot program, monitoring efforts have documented changes to the site from two hurricanes as well as routine natural processes over the past year. The site now serves as a training venue for engaging the public in citizen science monitoring and climate change impacts.

13 DEVELOPING A TYPOLOGY OF ADAPTION STRATEGIES FOR THE DOCUMENTATION AND PROTECTION OF HISTORIC PLACES ENDANGERED BY CLIMATE CHANGE IMPACTS

Author(s): Hermann, Carsten (Historic Environment Scotland) - Boro, Marte (Riksantikvaren) - Haugen, Annika (Norsk institutt for kulturminneforskning) - Sigurðarson, Guðmundur Stefán (Minjastofnun Islands) - Sonehag, Therese (Riksantikvarieämbetet)

Presentation Format: Oral

In 2018, following a storm, Dún Beag fort, County Kerry, Ireland, collapsed partially into the sea, despite remedial work in response to an earlier storm. In 2014, the polar hunting station Fredheim, Svalbard, Norway, was relocated landwards, because of the continued threat of coastal erosion. In 1994, the medieval Sueno's Stone, Moray, Scotland, was surrounded by a glass canopy to protect its ornate carvings from wind erosion. These examples illustrate the variety of responses to the environmental impacts of climate change on historic places, depending on climatic, place and societal contexts. These impacts, from natural hazards to slow, cumulative degradation processes, are not new, but increasing in frequency and magnitude due to anthropogenic climate change, resulting in more historic places threatened by environmental damage and degradation. Adaptation of historic places to these impacts leads to alterations of these places, often affecting adversely their cultural significance. Understanding at a conceptual level the options for adapting such places can helpfully inform our decision-making.

This paper systemically collates, categorises and analyses case studies. Understanding adaptation in the widest sense possible, the typology created will include examples ranging from conventional archaeological surveying and digital 3D recording to place protection, object alteration and relocation. The analysis of this case study collection will consider the concepts of authenticity and integrity, and educational, physical and socioeconomic factors, and produce a graph of gradually differing adaptation options.

The research forms part of the project Adapt Northern Heritage (ANH), funded by Europe's Interreg Programme for the Northern Periphery and Arctic. The case studies will focus on, but not be limited to, places in Europe's north, and include archaeological sites, historic buildings and built indigenous heritage. This paper's results will inform adaptation guidance being developed by ANH and be also useful for policy development and decision-making in heritage management.

14 MAKING CLIMATE CHANGE RELEVANT: COLLABORATIONS WITH COMMUNITIES ON THE COAST

Author(s): Ostrich, Stephanie (CITiZAN - Coastal and Intertidal Zone Archaeological Network; MOLA - Museum of London Archaeology)

Presentation Format: Oral

England is an island nation and archaeology in the coastal and intertidal zone is fundamental to understanding our coastal and maritime past. However this is an extremely dynamic environment under threat from wind, waves, and scour, effects which can be amplified by climate change with increased rain fall and ferocity of winter storms. However there is no statutorily informed intervention for coastal and intertidal heritage outside of the national planning framework for this at-risk archaeology and so no infrastructure in place to systematically record these freshly exposed sites before the next storm potentially washes them away. CITiZAN (the Coastal and Intertidal Zone Archaeological Network) is a community archaeology and citizen science project which raises awareness of this at-risk archaeology across England and works with local volunteers to identify, survey and monitor the long-term fate of their local coastal sites. This paper will discuss the importance of strong engagement with the public but also of translating this into collaborative work with communities. Lectures, outreach stalls, digital outputs, use of local and national media coverage and guided walks on sites around the country provide an opportunity for local communities to rediscover this hidden archaeology on their doorstep and to see the effects of climate change, erosion and flooding on a local level. Though the increased awareness of at-risk heritage in coastal communities is a CITiZAN project aim in itself, for this or any project to be sustainable this interest must

be successfully converted into participation, to encourage community involvement to adopt their own coastlines and monitor any changes that occur over time. Collaborative site interventions and community-led monitoring work make the global issue of climate change relevant at a local level.

15 FROM SITE VULNERABILITY TO 'DISASTER ARCHAEOLOGY': PERSPECTIVES FROM THE ALOA PROJECT IN THE FRENCH ANTILLES

Author(s): Lopez-Romero, Elias (LabEx Sciences Archéologiques de Bordeaux - LaScArBx) - Daire, Marie-Yvane - Martin, Chloë (UMR6566 CReAAH-Univ. Rennes1)

Presentation Format: Oral

Coastal areas across the globe are subject to rapid change. In the past, such events have shaped and critically transformed the landscape. In the present, the effects of current climate change -e.g. relative sea level rise, increased frequency of extreme weather events- are affecting not only natural landscapes, biodiversity, human populations, infrastructures and resources, but also a whole series of heritage sites and remains that are inherently non-resilient.

In continental France, the ALeRT (Archéologie Littorale et REchauffement Terrestre) project has successfully provided -since 2006- a series of tools and methodologies for the recording, the analysis and the recovery of scientific information from coastal archaeological sites threatened of destruction. One of the keys of the project's success relies on its public, community-based, perspective.

Stemming from this experience, we are now extending and adapting our methods to the Caribbean region in partnership with local organisations, agencies and stakeholders. In this paper we present the nature, objectives and advances of this ongoing project in the French Antilles and we discuss how the climatic events of 2017 (i.e. hurricanes Irma and Maria) have influenced its setting up and its perspectives of research.

While the historical, geographical and climatic conditions of this region are different from those we encounter in Atlantic Europe, the versatility of the methodologies and tools developed, as well as the focus on citizen action, comfort us with the idea that multivocal and trans-disciplinary approaches like this are the best way to analyse past climate changes, to confront contemporary ones and to better engage the public with their local heritage. Furthermore, we believe that in the traumatic scenario of post-natural disaster the study and preservation of such heritage can play a role in the reconstruction of the economic tissue and of the collective and individual identities.

16 ENVIRONMENTAL, SOCIAL AND ECONOMIC CHALLENGES: IMPLICATIONS FOR ARCHAEOLOGY

Author(s): Fleming, Arlene (The World Bank)

Presentation Format: Oral

The legal, regulatory and administrative framework for protection and management of archaeological and other cultural heritage resources is based on international agreements and national legislation that have developed and functioned during several decades of relative calm following World War II. The profound effects of climatic changes, already apparent, will undoubtedly lead to other disturbances, including population migration and displacement, conflict over scarce resources, economic stress, and weakened governing institutions. Specific examples illustrate the interrelationship of these conditions already observable in parts of the Middle East and North Africa with evident effects in Europe and other regions. Such situations, and anticipated future developments, present archaeologists with challenges as well as opportunities to develop systematic approaches for identifying, documenting, protecting and managing various categories of archaeological remains, including those in unexplored landscapes, in identified and partially excavated sites, and in recognized heritage places with substantial archaeological remains. Effective action will be facilitated by various approaches, including the use of new technologies for archaeological investigation, data collection, analysis and management. Electronic communication offers the possibility for stimulating broad public awareness and participation to assist archaeologists in the creation and preservation of the archaeological record. Several current initiatives and projects illustrating types of new approaches are presented and discussed. This paper follows and elaborates upon the author's presentation at the SAA meeting in April 2018 in the session on Climate Realities of Cultural Heritage and Archaeology.

17 CITIZEN SCIENCE IN THE INTERTIDAL ZONE: TWO CASE STUDIES MONITORING THREATENED ARCHAEOLOGY IN A DYNAMIC ENVIRONMENT

Author(s): Johnston, Helen (Thames Discovery Programme, Museum of London Archaeology - MOLA) - Ostrich, Stephanie (CITiZAN, Museum of London Archaeology - MOLA)

Presentation Format: Oral

Significant archaeological sites along England's coast and on the foreshores of tidal estuaries are being lost from natural and anthropogenic forces, continually eroded by winds, waves and tidal scour. The Thames Discovery Programme and CITiZAN: the Coastal and Intertidal Zone Archaeological Network work with citizen scientists from local communities to provide systematic responses to these threats to coastal and intertidal archaeology. This paper will compare and contrast the methodologies employed by both projects to involve the public in the monitoring and recording of intertidal archaeological features, including standard single context recording as well as 3D photogrammetry and CITiZAN's smartphone app, and discuss the implementation of standardised recording and monitoring using crowd-sourced data.

For the last decade, Thames Discovery Programme has worked with volunteer Foreshore Recording and Observation Groups (FROGs) to monitor and record the fragile archaeology of the Greater London Thames foreshore. Since 2015, its sister project CITiZAN has employed similar methodologies on a country-wide scale to record vulnerable sites in detail and regularly monitor their fate. Coastal erosion can rarely be halted but the hope of Thames Discovery Programme and CITiZAN is to involve the public as citizen scientists to help ensure archaeological sites can be recorded before they are destroyed.

18 **ARCHAEOLOGY AND ACTIONABLE GOVERNMENT RESULTS FOR CLIMATE CHANGE: STATE OF THE ART VIA THE US GLOBAL CHANGE RESEARCH PROGRAM**

Author(s): Rockman, Marcy (US National Park Service) - Hritz, Carrie (National Socio-Environmental Synthesis Center, University of Maryland) - Rick, Torben (Smithsonian Institution) - Winthrop, Rob (retired)

Presentation Format: Oral

Within archaeology, it is widely recognized that the field has much to offer present and future efforts to address climate change. This may be directly through data, improved models of human adaptation, building or preserving modern connections to place, to name a few. However, to date and despite numerous calls, these have not been well-incorporated into global and national efforts to address climate change. At a National level address, in 2016 the US Global Change Research Program (USGCRP) undertook a two-year interdisciplinary social science project to support preparation of the fourth US National Climate Assessment and other ongoing federal work. Engaging the disciplines of archaeology, anthropology, geography, and sociology through their primary US-based professional societies, this project brought together academic scholars and federal social scientists to collaborate on three topics: social science methods, vulnerability, and drivers of climate change. This paper presents the experiences of three archaeologists and one anthropologist involved in this project and an assessment of what worked in integrating archaeology into interdisciplinary social science for national approaches to global change and what was a challenge. This paper concludes with recommendations that are timely and relevant for global efforts to improving the art of connecting study of the past to actionable government results for global climate change.

19 **PRESERVING HERITAGE SITES IN A CHANGING CLIMATE? ARCHAEOLOGY OF CLIMATE CHANGE IN THE PAST AND PRESENT**

Author(s): Martens, Vibeke (NIKU - Norwegian Institute for Cultural Heritage Research; CCH - EAA Community on Climate Change and Heritage)

Presentation Format: Oral

How might researchers and heritage management agencies contribute to climate change adaptation on local, municipal scale as well as on national and global scale? An interdisciplinary response will be necessary, as these questions are extremely complex and cannot be answered from one discipline alone. To adapt to a changing climate and still try to preserve heritage sites will require meteorological data, geological studies, conservation science and archaeology as a minimum.

In situ preservation strategies place a large responsibility on present and future generations, as the concept implies that the heritage sites will remain unchanged 'forever'. Recent research indicates that in situ site preservation in some cases may be more an illusion than reality. If archaeological sites are chosen for preservation, these sites should be monitored to evaluate their current state, safeguarded with physical protection measures or mitigation actions and, not least, communicated to both the scientific community and a wider audience. In this way one might implement both the Valletta and Faro Conventions. Involvement of local agencies, heritage managers, schools and private citizens may be the best way forward but should be guided from the most recent research for the best possible outcome. Is modern archaeological practice up to the task? This paper brings into discussion all presentations from this session.

480 **RESEARCH ON ARCHAEOLOGICAL PRACTICES AND KNOWLEDGE WORK IN THE DIGITAL ENVIRONMENT**

Theme: Theories and methods in archaeological sciences

Organisers: Huvila, Isto (Uppsala University) - Lauzikas, Rimvydas (Vilnius University) - Dallas, Costis (University of Toronto)

Format: Regular session

In spite of the rapid on-going introduction and development of digital tools and infrastructures for archaeological work, relatively little is known about how digital information, tools and infrastructures are used by archaeologists and other users and producers of archaeological information. Both archaeologists and researchers in adjacent fields from museum studies to ethnology, information studies and science and technology studies have conducted research on the topic but so far, the efforts have tended to be somewhat fragmented and anecdotal. Contributions are invited from researchers conducting evidence-based and applied research on archaeological practices, knowledge production and use in archaeology and other relevant disciplines including reflective and comparative studies of the use of different tools and infrastructures and their implications and consequences to how archaeological work is done and knowledge is produced both in professional and academic,

and in community archaeology contexts outside of scholarly domain. The presented work can be based, for instance, on ethnography, case studies, literature reviews, focus groups, or questionnaire-based studies, or on reflexive reports of presenter's own projects, which seek to examine the own practice critically by looking at roles of different participants/stakeholders, competencies and skills involved, methods, tools, and processes of working with information, knowledge and meaning-making with archaeological materials, either in academic and professional archaeology, or in community, creative, and cultural industry contexts. Session is affiliated with the COST Action ARKWORK (http://www.cost.eu/COST_Actions/ca/CA15201).

ABSTRACTS

01 ONLINE COLLABORATIVE PLATFORMS AND 3D VISUALISATION FOR INCREASED INTEROPERABILITY, INTEGRATION AND INTERPRETATION IN ARCHAEOLOGY

Author(s): Galeazzi, Fabrizio (Department of Archaeology, University of York) - Jensen, Peter (Department of Archaeology and Heritage Studies, Aarhus University)

Presentation Format: Oral

Digital tools and data infrastructures have been rapidly introduced to archaeological practices throughout the past decades, however the role played by 3D documentation and visualisation in the development of the field is not yet thoroughly explored. This paper discusses the impact and potential of applied 3D technologies in the development of new methods and practice with a particular emphasis on real-time data recording and on-site visualisation during excavation. To date, several attempts have been made to test and integrate 3D methodologies on-site, but none of them allowed for a serious and complete evaluation of potential and limitations of using 3D.

The site selected for this research is the UNESCO World Heritage Historic Centre of Rome. Understanding its complex and inter-leaving layers of occupation and re-use remains one of archaeology's enduring problems. Traditional methods of site recording rely on 2D representations, analogue line drawings and ring binders of pro-forma. But Rome and other urban sites with long histories are complex three-dimensional entities with volume and depth and interwoven strata. As a consequence, data is frequently collected by different teams, at different times and in different ways, resulting in dispersed and fragmented records that are extremely challenging to integrate. To further complicate matters; 3D acquisition usually requires substantial computer processing time and results in chains of derived data, which may not align perfectly with the excavation methods, workflows and documentation ideals.

This research aims at clarifying: if the development of online 3D collaborative platforms on-site can make data instantaneously available and integrated to support online study, analysis and verification of hypotheses; and how visualisation and virtual manipulation of 3D representations of archaeological stratigraphy during excavation may affect thinking and interpretation processes in archaeology.

02 SHIPWRECKS IN PERIL: 3D MODELLING AS A RAPID RECORD FOR COASTAL ARCHAEOLOGISTS AND VOLUNTEERS IN CUMBRIA

Author(s): Mason, Nick - Sherman, Andy (CITiZAN)

Presentation Format: Oral

Winter storms are increasing in frequency and ferocity, driven by climate change. This increase in winter storms is leading to more archaeological features being uncovered on the coast and greater damage to already known features. In an ideal world professional archaeologists or well-trained volunteers can quickly respond to newly identified features, which need to be recorded before they are re-covered by intertidal sands or destroyed by the sea. However, short timescales, narrow tidal windows, a lack of available volunteers, isolated locations and further damage from storms and less-heritage minded members of the public can all increase the difficulty of recording such features adequately. Digital 3D recording such as photogrammetry can help mitigate some these of concerns, with models capable of being produced with little more than a mobile phone and tape measure. These models can be produced in the field quicker than traditional scaled plans and can be happily completed by volunteers or members of the public with less training. The models can also provide a detailed view of features for specialists, who may not be available on site, once they have been fully processed. But can 3D modelling sufficiently replace traditional methods in creating a complete record, and how reliable is data captured in this method by volunteers? This paper will look at the process and practicalities of building 3D models on the foreshore, using several wrecks identified on the Cumbrian coast this winter and the experiences of the CITiZAN team as examples, and examine the exciting possible uses of this technology in terms of both professional archaeology and volunteer engagement.

03 VISUALISING UNCERTAINTY – A RESEARCH PROJECT FOR KNOWLEDGE PRODUCTION THROUGH THE EXPLICIT REPRESENTATION OF UNCERTAIN KNOWLEDGE IN ARCHAEOLOGY

Author(s): Lengyel, Dominik - Toulouse, Catherine (BTU Cottbus-Senftenberg)

Presentation Format: Oral

Visualising Uncertainty is a research method at the intersection of architecture, archaeology and art history. It focuses on translating the inherent uncertain knowledge of spatial archaeological or art historical hypotheses. The starting point is the gap between

verbal description of hypotheses, that clearly address uncertainties, and the common way of representing them in seemingly realistic ways. The approach takes the verbal uncertainty and uses methods of architecture to design spaces, that take over abstraction of the verbal hypotheses to make them explicitly visible. The aim is to make these hypotheses accessible for visual thinking as a complementary addition to verbal thinking. Mainly through the design of abstract forms, the uncertainty is preserved, and the resulting illustration transports content and its degree of uncertainty simultaneously. As these illustrations also arise new questions, they indirectly query and directly produce archaeological knowledge. Archaeologists are usually not accustomed to evaluate their spatial hypotheses spatially but rely on sketches and verbal description. As a result of the transdisciplinary work, archaeologists' respectively art historians were at least stated with substantiated questions, but also proposals for deeper investigations, key arguments in judging ambiguous hypotheses and sometimes even impeachments of their hypotheses. By reference to these results, the paper demonstrates the presenters' own projects to examine the different methods, tools, participants, and competencies involved while working with information and knowledge in academic and professional archaeology. Projects shown are among others the authors' Chair's projects Ancient Metropole of Pergamon, developed in cooperation with the excavation director on site during the last ten years, and The Sasanide Residence of Ktesiphon, developed with the Museum of Islamic Art in Berlin, both projects funded by the Excellence Cluster TOPOI by the German Research Foundation DFG, and the authors' professional office's projects Cologne Cathedral and Bern Munster, developed for the respective Cathedral administration.

04 AN EVALUATION APPROACH TO USERS EXPERIENCE AND PERCEPTION OF ARCHAEOLOGICAL INTERACTIVE 3D MODELS

Author(s): Dolcetti, Francesca (University of York)

Presentation Format: Oral

The technologies used for the visualisation of archaeological sites have greatly advanced in recent decades and 3D models have become widely adopted not only for research purposes but also for museums exhibitions and displays. However, the increasing availability of these technologies has often led to their uncritical adoption, without a clear idea of how they might be used and perceived, or what impact they might have upon different audiences.

It does not matter, in fact, if they remain within the academia or they are disseminated among a broader public: 3D models will be exploited by others according to purposes and modalities that are probably different from those of their creators. A proper evaluation framework is then crucial to understanding what kind of relationship occurs between a 3D model and its users.

Drawing on the case study of the Middle Bronze Age Cypriot settlement at Erimi- Laonin tou Porakou (2000-1450 BC), this presentation will introduce a study conducted to assess how varying audiences perceive 3D interactive visualisations of archaeological sites, engage with and learn through them. It will focus on the methodological approach used to present an interactive 3D model to three different user groups (experts, non-experts and students) and collect their feedback via questionnaires, interviews and focus groups.

The results of this study show interesting responses in terms of engagement from both professional and lay users and highlight several key topics, such as the role of immersion and interactivity in enhancing user experience and promoting learning, as well as the perception and acceptance of avatars. This presentation will, furthermore, provide a critical reflection on to what extent interactive 3D models in archaeology produce excitement and emotional response, fostering desire for knowledge about or interaction with past cultures.

05 WHAT KIND KIND OF ARCHAEOLOGY DO WE TEACH AND TO WHOM?

Author(s): Susic Klindzic, Rajna (Faculty of Humanities and Social Sciences University of Zagreb)

Presentation Format: Oral

Here we will present results of the research conducted in the frames of the ESF funded project: "Tuning of Study Programs in Humanities and Social Sciences with Labor Market Requirements." In the project participated 7 disciplines taught at the University of Zagreb Faculty of Humanities and Social Sciences, Zagreb, Croatia. Two surveys were conducted. First survey was conducted on students who obtained degree in Archaeology in the period 2003.-2015. Second survey was on employers engaged in various kind of work in archaeology – scientific institutions, museums, heritage protection offices, private companies etc. At the moment, it seems that university curricula in the Croatia does not meet the challenges and requirements (and trends) in archaeology which – being extremely wide and multidisciplinary field – requires a variety of knowledge and skills which are not all taught at Universities. Requirements posed by spatial planning, demands for elaborate use of various digital technologies and solutions and mandatory interdisciplinarity could not be easily inserted and trained at academic curricula. Here presented results of the surveys are in accordance with this statements, showing high disproportion between requirements of labor market and the competencies provided by the Archaeology study program. This research is used as a guideline for the changes in the curricula.

TRADITIONAL AND (ALTERNATIVE) NEW MEDIA: DIFFERENT WAYS TO COMMUNICATE UPON ARCHAEOLOGY

Theme: Archaeology and the European Year of Cultural Heritage

Organisers: Basterrechea, Aurélia (ArchaeoConcept) - Fonseca, Ana Sofia (ICArHEB, Algarve University; DAI MOOCs coordinator)

Format: Session with precirculated papers

This session is going to discuss the role of traditional, alternative and new media in the communication of archaeology as a profession and as an interpretation of societies of today and yesterday. Technologies of information and communication (TIC) are central in the way we do archaeology today but their uses are rarely discussed amongst archaeology professionals.

Our aim is to address the issues of communication between archaeologists or amateurs and the wider public through TIC. In this context, we would like to discuss the roles of traditional media (journals, specialized or not, conferences, exhibitions, etc.); new media (Youtube history channels, MOOC, TEDx, blogs, social networks, apps, etc.) and alternative media ((video-) games, comics, etc.).

This will allow the participants to reflect upon the following questions: what is said about archaeology in the mediatic field? With which means does archaeology express itself? How do new media create discourses on archaeology and what are the contents of these discourses? What are the opportunities (e-learning, etc.), limits (access to electronic devices and internet, etc.) and threats (fiction VS reality, sensationalism, etc.) of the digital ways of communicate on science?

Underpinning issues that will be discussed are the growing phenomenon of "Do it Yourself" science, interpretation and transmission - that considers itself more democratic - and the relative emancipation of "knowledge producers" from the scientific institutions and its consequences.

The session will be very participative. It might be a pre-circulated papers session to have enough time to organise a workshop with the attendants.

ABSTRACTS

01 PREVENTIVE ARCHAEOLOGY IN REGIONAL NEWSPAPERS IN HISTORICAL PERSPECTIVE : THE CASE OF FRENCH-SPEAKING SWITZERLAND

Author(s): Javet, Raphaëlle (Université de Neuchâtel)

Presentation Format: Oral

As other country in Europe, Switzerland experienced a very important territorial and urban development since the 1960s. This influence on the territory modified significantly the way of doing archaeology: methods of intervention, framework of work, goals of excavations, data processing, etc. Preventive archaeology also constitutes a change of mission for archaeologists working to collect data on the ground before destruction of remains. In the archives of the regional newspapers of French-speaking Switzerland, we have examined articles about Swiss archaeology thought quantitative and qualitative methods, and analysed the way in which preventive archaeology was presented. We compared our observations with newspaper archives from the previous three decades (since 1930). Our results show that the regional print media often echoes methodological changes and highlights the new scientific and systematic aspects of archaeology. But the clichés related to archaeologists and archaeology (treasure hunt, adventure and exploration, mystery, etc.) are still very present. Above all, the paradigmatic change that the practice of preventive archaeology represents is almost never thematised or explained in regional journals. This lack of preventive archaeology as explicit regional newspapers subject is mainly due to the archaeologists' unease with their role as a preventive archaeologist. The consequences are often a misunderstanding from the public about the goal of archaeologist as "heritage rescuer".

02 POPULARISING ARCHAEOLOGY: ISSUES & POTENTIALITY OF NEW TRANSMISSION TOOLS

Author(s): Basterrechea, Aurélia (ArchaeoConcept) - Cousino Rivera, Hugo (Freelance Journalist)

Presentation Format: Oral

While traditional media are dealing with the cultural issues about history and archaeology with a classic journalistic approach (interviews, great discoveries, objectivity), new media are building their own way of telling about science (first person monologue, specific stories, subjectivity).

Nowadays, YouTube constitute a valuable source of information upon every field and subject. One and a half billions of people watch contents on this video platform each month and anyone can indeed open his own channel and upload his self-made videos. Some YouTubers are followed by thousands people through the world. Beyond the most well-known of YouTubers, the history channels Extra History and History Buffs count more than one million followers each and all their videos have been watched in average one million times, which gives an idea of the huge impact they have on the public.

Video games appeared to be a great catalyst in various ways of discussing cultural contents, such as history, archaeology or politics. To some videographers born in the late 1980's, the video game universe provided a solid basis to address other topics, which came in their mind afterthought.

Our aim is to analyse this trend in the French speaking web world. Historic channels are not only run by archaeologists or historians,

but also by amateurs and connoisseurs, telling about history, prehistory or the practice of archaeology itself.

In this study, we intend to question the content and format of these videos, but also the links between science and publics. Do this DIY transmission must be owned only by legitimate specialized scientists in their discipline? What do professionals think about this way of popularizing science? Towards which dangers and derives might this model lead to? At the opposite, how can professionals use those numeric tools to promote the transmission of their discipline?

03 DESIGNING THE PAST: VIDEO GAMES AS A TOOL TO COMMUNICATE SCIENTIFIC KNOWLEDGE

Author(s): Rubio-Campillo, Xavier (The University of Edinburgh; Murphy's Toast Games) - Boj, Isabel - Hernández Cardona, Francesc Xavier (Universitat de Barcelona) - Mayans, Jaume (Murphy's Toast Games) - Sospedra Roca, Rafel - Yubero-Gómez, Maria (Universitat de Barcelona)

Presentation Format: Oral

Video games are one of the most appealing media at our disposal to communicate knowledge about the past. The unique combination of interaction and storytelling they offer allows the player not only to see the recreated world, but also to experiment it in ways that cannot simply be achieved by any other media.

This potential is explained by the fact that the player needs to take an active role inside the recreated world. This world should always be crafted to strengthen game mechanics and this requirement presents a challenge to anyone that wants to use games for scientific outreach; the most scientifically accurate version of the past will be meaningless if the story, characters and dynamics of the game cannot capture the interest of the player. As a consequence, the creation of an educational video game should be guided by the basic requirement that the game needs to be fun.

What are the best approaches to combine knowledge transmission with fun? Does the goal of scientific dissemination affect the process of game design? Can an educational game even compete with high budget projects while seeking for players' interests?

We present here the creation of a video game based on the discoveries made at the UNESCO World Heritage archaeological site of Atapuerca, Spain. Our main aim is to promote discussion on the unique decisions taken during the design of a video games purposely created for scientific communication on human evolution.

04 VIRTUAL RECONSTRUCTION, STORYTELLING AND IMMERSIVE ENVIRONMENTS, A NEW PATH TO COMMUNICATE ARCHAEOLOGICAL SCIENCE TO THE WIDER PUBLIC. ULLASTRET3D CASE STUDY

Author(s): Codina, Ferran (NORFEU SC) - Prado, Gabriel (Museu d'Arqueologia de Catalunya) - Ruiz, Isis - Sierra, Albert (Agència Catalana del Patrimoni Cultural)

Presentation Format: Oral

Communicating with wider audiences is not easy for the archaeological museums. In Ullastret3D project we have achieved a very high level of understanding of the archaeological site history and remains by the general public using storytelling as communication strategy and virtual environments (immersive room and virtual reality headsets) to reach the minds of the visitors.

During two years we have been working to process the exhaustive archaeological research of the ancient town of Ullastret (2200 BC) to a complete 3d model of the town that can be experienced in an immersive room and virtual reality. The team of archaeologists, designers, and programmers have preserved the historical rigour throughout the process, inspired by the London Charter.

As work started on the immersive outputs (room and VR experience), a detailed study of existing 360° videos and available VR experiences was undertaken to determine the communication approach. Storytelling was the choice creating a story that contained key elements of Iberian culture such as the inhabitants' totemic animals, the social prevalence of warriors, and the collapse brought about by the Roman Empire. The story embroils visitors in the dream of a member of the settlement's elite that returns to the town and remembers fragments of his life. This narrative makes it possible to use the protagonist's voice to guide visitors around each of the scenes included in this dream-like environment.

Visitors have responded enthusiastically to both the individual VR and the group immersive room experiences. With regard to the latter, the impact created by some of the scenes, such as the flight over the Iberian town, and the appearance of objects that visitors can later see in the museum display cabinets, demonstrates that this new medium is highly effective communicating archaeological knowledge.

05 AUDIENCE DEVELOPMENT AT THE ROMAN RUINS OF TRÓIA THROUGH DIGITAL MEDIA

Author(s): Magalhães, Ana - Pinto, Inês (Troia Resort; CEAACP - Universidade de Coimbra) - Brum, Patrícia (Troia Resort; IHC - NOVA FCSH) - Santos, Filipa (Troia Resort)

Presentation Format: Oral

Present world leader companies such as Apple, Alphabet, Microsoft and Facebook are linked to digital universe and social media. These companies reflect new consumer trends, always connected, eager to comment, intuitive but informed, seeking to be engaged and expecting immediate results.

Archaeologists and cultural managers throughout the globe must embrace this new paradigm to engage audiences and add value into the 21st century communities. Archaeology must reach people to be relevant and digital media is the most effective way to

address current society. But how to face this challenge without losing scientific quality?

The Roman Ruins of Troia, located in Portugal, on the left shore of the Sado River and about 50 km away from Lisbon, are the largest fish salting production center from the Roman Empire. This National Monument in the Portuguese Indicative List of World Heritage has an Enhancement Project developed by a private company, TROIA RESORT, owner and promoter of the touristic development of the Troia Peninsula.

From the private point of view, it is crucial to achieve sustainability on the project and align research with a business perspective, opening the site to the public, in which the visitor's income plays an important role. Within this framework, it was important to seek a new management strategy aligned with the new consumer pattern defined by an algorithm and emotionally attached to digital media. Therefore, this paper presents the work done in the past year using digital media in the development of audiences at the Roman Ruins of Troia.

This new communication plan allows the spreading of the site's impact factor and ultimately can be a more cost-efficient tool to enlarge visitors in the site and improve the quality of their visit.

06 THE NAUTICAL ARCHAEOLOGY SOCIETY, A CASE STUDY OF COMMUNICATING WITH DIFFERENT COMMUNITIES: PLAIN SAILING AND HIDDEN HAZARDS

Author(s): Richardson, Miranda (NAS/IJNA) - Knott, Peta (NAS)

Presentation Format: Oral

The Nautical Archaeology Society provides an excellent case study for the use of traditional and new media for communicating archaeology. Unlike other learned societies, the NAS was formed in 1974 with the primary role of avocational fieldwork training to educate the growing diving community about the value of underwater archaeology. In parallel with this, the NAS plays a role in shaping international heritage policy and publishes the *International Journal of Nautical Archaeology*, the leading academic journal for the subject. There are (at least) three overlapping groups the NAS communicates with: academic and professional archaeologists; avocational archaeologists and divers; and the general public. Each of these groups has nuanced communication needs that embrace both traditional and new media.

NAS communication has been designed to counter the effects of the destructive public image of treasure hunting for gold-laden wrecks and to establish the scientific basis of the discipline. 'Do it yourself' science and the democratization of data are at the core of these endeavours. The challenges of working in the marine environment have meant early uptake of new digital technologies on site that are easily transferred to modern means of communication. Moreover, the inability of the vast majority of the public to experience the sites first-hand has made innovative ways of communicating their heritage and archaeological value a necessity. Methods used include: journal articles, conference talks, supporting a MOOC, eLearning, hands-on training days, YouTube channel, Social Media (Facebook, Twitter, Instagram, etc.), and, most recently, virtual dive trails.

While the combination of audiences NAS communicates with and the concomitant variety of methods used has developed organically, NAS and the IJNA have now reached a point where strategies need to be put in place for a more coherent use of ICT for future growth and benefit.

07 WHY ARCHAEOLOGY MATTERS? DIGGING UP ARCHAEOLOGY ROLE IN MODERN SOCIETIES

Author(s): Fonseca, Sofia (ICArEHB, Algarve University; IEPOA, Universitat Autònoma de Barcelona; Deutsches Archäologisches Institut, DAI) - Linstädter, Jörg (Deutsches Archäologisches Institut, DAI) - BICHO, Nuno (ICArEHB, Algarve University) - HONEGGER, Matthieu (Institut d'archéologie, Université de Neuchâtel) - Haws, Jonathan (Department of Anthropology, University of Louisville)

Presentation Format: Oral

More than what archaeology is or how archaeologists work, or even what the society can ask/ expect from us, nowadays the main question concerning archaeology is how we approach and assume a more practical and effective role in the society. Not in terms of scientific value, undeniable in large scale around the world, but in a more approachable and visible way. Making use of the new technologies and using new ways to communicate our role in the society is a big challenge that we must embrace. Our proposal to face this challenge can be divided in two projects: 1. create the first MOOC on African Archaeology and Heritage; 2. create a podcast about archaeology, culture and heritage, with an approachable and friendly voice. The MOOC, organized by the German Archaeological Institute (DAI) in a consortium with the ICArEHB from the Algarve University, Portugal, the University of Neuchâtel, Switzerland, and the University of Louisville, United States of America, will be accessible to anyone in the world. Our main goal is to form the next generation of experts on African Archaeology and Heritage wherever they are by offering the possibility of study and learn how to preserve African heritage to future generations. With the podcast our mission is to bring archaeology to the daily life, explaining why archaeology and heritage matters and how they can connect us in our collective journey, creating bridges where nowadays we build walls. It will be a podcast from archaeologist and scientist of the human cultures to the general public.

In this meeting we will present our projects and discuss their strength and weaknesses with the archaeological community, hoping to have new and interesting insights.

MEANINGFUL PLACES: INTEGRATING THEORIES, METHODS AND SCIENTIFIC TECHNIQUES IN THE ARCHAEOLOGICAL STUDY OF A DWELLING PLACE

Theme: Theories and methods in archaeological sciences

Organisers: Prijatelj, Agni (Durham University, Department of Archaeology) - Wouters, Barbora (Centre for Urban Network Evolutions - UrbNet, Aarhus University, School of Culture and Society; Department of Art Studies and Archaeology, Vrije Universiteit Brussel)

Format: Regular session

Dwelling places are vibrant, hybrid, participant and continuously changing: entangled within a meshwork of multiple symmetric and fluid connections between matter, people, animals, plants, things, places and landscapes, they are suffused with meanings, memories and different temporalities. How do we, then, approach the task of recounting their complex social histories?

Over the years, a number of theoretical advances in addressing the nature of various places have been made: these include phenomenological and cultural biography approaches, as well as various network and agency theories. At the same time, the expansion of scientific techniques ranging from non-destructive and digital technologies to an array of geoarchaeological techniques has enabled the study of particular places at an unprecedented level of detail. Yet dialogue between archaeological theorists and archaeological scientists on the nature of dwelling places has too often been non-engaging.

With this session, we aim to bring together scholars who are keen to integrate various theories and scientific techniques in order to achieve a more complete and nuanced understanding of dwelling places and their particular place-power (cf. <https://www.nationaltrust.org.uk/documents/places-that-make-us-research-report.pdf>). Possible themes include a discussion of both theoretical and scientific perspectives on:

- 1) how places make us, and how we make places;
- 2) how a sense of identity and belonging is shaped through people's interactions with particular places; and
- 3) how places can be understood through the lens of power tensions, as triggered by different social engagements with them.

ABSTRACTS

01 IN SEARCH OF THE COMMON GROUND: DWELLING PLACES IN ARCHAEOLOGICAL THEORY AND ARCHAEOLOGICAL SCIENCE

Author(s): Prijatelj, Agni (Durham University)

Presentation Format: Oral

This introductory paper provides an account of the changing landscapes of theory and science in the archaeological study of a dwelling place. In its first part, it charts a number of theoretical advances in addressing the nature of various dwelling places, as well as the scientific techniques that have, over the last 20 years, enabled them to be studied at an unprecedented level of detail.

Following up a longstanding debate on the relationship between theory and science in archaeology (e.g. Jones 2002, 2004; Martín-Torres & Killick 2013; Pétursdóttir & Olsen 218), the paper addresses, in its second part, the continuing divide in aims, approaches and narratives in the study of a dwelling place, as conducted by archaeological theorists and scientists respectively. After discussing the ways in which the two groups' approaches frequently diverge, and the reasons for their divergence, I propose that the recent emphasis on New Materialism and various relational ontologies could provide a fruitful common ground for dialogue between the two discourses. I exemplify this by providing a brief outline of my own doctoral research, which has combined assemblage theory and soil micromorphology in the study of anthropogenic and biogenic deposits at a prehistoric temporary dwelling place for shepherds and their flocks.

In the final part of this introduction, I describe the structure of the session, and place the papers in context by providing an outline of the theoretical approaches and scientific techniques employed by the contributing authors, as well as the types of dwelling addressed in their papers, and the consequent sequence of their presentations.

02 DWELLING WITHOUT THE DWELLINGS: MOBILE WAYS OF INHABITATION IN PREHISTORIC EUROPE

Author(s): Kador, Thomas (University College London)

Presentation Format: Oral

Having spent most of the past 15 years researching human movement, mobility and migration – with particular reference to prehistoric Europe – I have arguably neglected somewhat the role of settlements (or dwellings) as fixed places in the landscape in favour of more ephemeral evidence for people's mobile lives. However, in this presentation I wish to propose a perspective beyond the dichotomous sedentary-mobile or settlement-landscape approaches by focusing on a long-term lifecycle of landscapes that equally encompasses all actors present within them, be they human or non-human; including places, objects and animals. In a similar vein, this approach advocates overcoming the often equally dichotomous employment of socially informed interpretations on one hand and scientifically informed accounts on the other, by bringing together multiple sets of evidence to address the same question from different perspectives. More specifically, this relates to how people moved in and engaged with the landscape. Thus I will try to demonstrate that rather than people's sense of identity being shaped by their interaction with particular places, people, places

and other actors in the landscape emerge and re-emerge together from their day to day encounters with one another. In other words, they continually shape and re-shape each other's identities. To practically illustrate this I will present two case studies from prehistoric Ireland, situated some 1500 years apart, during the later Mesolithic and middle Neolithic periods respectively.

03 DWELLING BEYOND THE DOMESTIC: UNDERSTANDING THE FORMATION AND ABANDONMENT OF BURNT MOUNDS THROUGH GEOARCHAEOLOGY

Author(s): Gardner, Tom (University of Edinburgh)

Presentation Format: Oral

Burnt mound sites are not domestic. Neither are they industrial. They represent a class of monuments that are not conventionally studied in analyses of place-making, meshworks, or temporalities. This, however is also for the best, as they present something of a blank canvas for archaeologists to project models onto, free of preconceptions of what constitutes 'dwelling'. As archaeological scientists we are poor at seeing the individual experience or assessing landscape or socio-economic change in anything other than broad periods. Geoarchaeology, alongside synchronised and modelled scientific dating, can begin to enlighten us on the details of higher-resolution chronologies and activities, which then allows discussion of how places come into being, are used, and are abandoned. In short; dwelling.

Geoarchaeological investigations of a suite of Bronze Age burnt mound sites across northern England and Scotland has allowed, for the first time, a detailed assessment of how these sites came to be formed, their individual biographies, and their abandonment. The position within prehistoric landscapes and within the lived experiences of Bronze Age communities is now clearer. Radiocarbon dating, Bayesian modelling, and pOSL analysis shows us that large suites of burnt mound sites were deposited and used for periods of over 800 years within dynamic local landscapes, and that despite the ongoing social change of the early- to late-Bronze Age, the depositional nature of these sites did not change. Equally, micromorphological and multi-element analysis by μ XRF has identified hundreds of individual events of deposition within these monuments, many discretely distinct from each other, which point to the more detailed patterns of acting in, and dwelling around, these sites.

04 'DIGGING' DEEPER: INTEGRATED APPROACHES TO ROUNDHOUSE BIOGRAPHIES AT BROXMOUTH, SOUTH-EAST SCOTLAND

Author(s): Buster, Lindsey (University of Bradford)

Presentation Format: Oral

The Iron Age hillfort of Broxmouth in south-east Scotland represents one of the most fully excavated, best preserved and most celebrated later prehistoric sites in Scotland. Despite this, the site (excavated in 1979) languished as legacy project for the next thirty years – reaching full publication only in 2013. Though unfortunate in some ways, this time lapse between excavation and post-excavation analysis has presented a number of opportunities, thanks to theoretical and methodological developments in the discipline, to ask new questions of this old data and to tease out more from it than would have been possible at the time. A unique set of preservation conditions, coupled with Bayesian modelled AMS radiocarbon dating and the adoption of biographical and materiality frameworks for interpretation have, for example, revolutionised our understanding of the dynamic and central role that roundhouses played in the social identities of the Iron Age communities at Broxmouth, not least in the finer-grained resolution it has provided on past dwelling practices. This has allowed not only for deeper insights into what it meant to 'dwell' at Broxmouth, but has broader implications for the study of domestic architecture (and the potential interpretative power locked away in old archival material) more generally.

05 OPEN SPACES AS SOCIAL PLACES: EXPLORING THE DYNAMICS OF OUTDOOR ACTIVITY CONTEXTS IN NEOLITHIC VILLAGES THROUGH MICROMORPHOLOGICAL ANALYSIS

Author(s): Koromila, Georgia (University of Reading)

Presentation Format: Oral

One of the most traditionally recognisable archaeological features of the Neolithic has been the house, as manifestation of household identities and principal context of social negotiation. In contrast, outdoor, unbounded spaces remain at the margins of research agendas and poorly understood. There is no reason, however, to assume that such areas were not equally meaningful contexts of activity and social interaction within Neolithic communities.

To explore this issue, this research employed a high-resolution micro-stratigraphic approach onto open-area contexts of three Neolithic settlements in northern Greece; the key methodological element comprises micromorphological analysis, which enabled the examination of sedimentary sequences in high stratigraphic resolution, the identification of microscopic residues in their depositional and contextual relationships, and the assessment of their histories of deposition and subsequent alteration.

This micro-contextual dataset provided insights into spatio-temporal activity patterns on multiple timeframes, from the microscale to broader narratives of continuity and change. The results demonstrate that a wide range of activities, tasks, and roles were performed in open areas, e.g. open fires, penning and interaction with animals, mobility and passage, preparation and maintenance of surfaces and features, and discard practices. The spatial and temporal variability of such practices highlights open areas as non-uniform, diverse places of human action and experience, and contributes to a nuanced understanding of these as dynamic places with

complex histories.

Reaching beyond empirical interpretation, this paper situates the role and significance of open-area activities within current archaeological debates, e.g. the intersection between households and supra-household groups, and the interplay between variability and homogeneity at the household and community levels. Thereby, this research provides an example of how micro-scalar methodological approaches can enable us to inform and substantiate discussions that intersect with broader analytical frameworks and theories.

06 HOW ARCHAEOLOGICAL SCIENCE PROMPTED A RE-THINK OF TRYPILLIA MEGA-SITES: THE CASE OF NEBELIVKA, UKRAINE

Author(s): Chapman, John (Durham University) - Gaydarska, Bissierka (Independent researcher) - Nebbia, Marco (Durham University)

Presentation Format: Oral

The Trypillia mega-sites of Ukraine are currently regarded as the largest settlements in 4th millennium BC Europe, if not the world, dating earlier than the first cities in the Near East and China. The traditional view amongst Ukrainian and other European archaeologists is that the mega-sites were permanently occupied over the long term by very large population aggregations, with estimates of up to 20,000 people. However, during recent investigations at the mega-site of Nebelivka, experimental archaeology and scientific analyses of a sediment core taken from close to the mega-site have cast doubt on this 'maximalist' position. These scientific results, and other data, challenge us to re-conceptualise the mega-sites as short-term, possibly seasonal meeting places / pilgrimage centres or permanently occupied sites with much smaller populations. In this paper, we seek to confront the settlement plan, subsistence models and place-value of Nebelivka with the lack of human impact as shown in the pollen diagram. The result is a very different narrative for these massive settlements. There are currently three competing models for mega-sites with smaller populations and shorter occupation spans. At this point, we move away from the archaeological science to postulate mega-site dwelling models inspired by the growing number of low-density urban sites in the world.

07 MATERIAL EXPRESSIONS OF LOCAL LEVEL SOLIDARITIES AND CONFLICTS IN EGALITARIAN LIFEWAYS AT ÇATALHÖYÜK

Author(s): Govier, Eloise (University of Wales Trinity Saint David)

Presentation Format: Oral

In response to concepts of 'belonging', 'identity', and 'power', I offer a theoretically-informed approach to the residues of material engagements to understand local level solidarities and conflicts at the Neolithic settlement Çatalhöyük. Rooted in an approach that synthesises 'phenomena' (Barad 2003, 2007, 2012), and pedagogical understandings regarding 'communities of practice' (Lave and Wenger 1991; Wenger 1998, 2012; Wendrich 2013), this paper identifies key making events during the lifespan of the egalitarian settlement. Despite the uniformity in house construction, grain stores, and material access (see Hodder and Cessford 2004); different making methods (or 'practices') - some visible, some invisible (see Love 2013) - are evident at the settlement. By beginning with the premise that a practice is the 'property' of a community (Wenger 2012: 2), I argue these events indicate that knowledge formed through material engagement was contained within the community of practice, and did not always penetrate the walls between houses. Building on the vital materialist arguments I have presented elsewhere, here I attend to the materiality of certain making events, and highlight the ruptures and flows of knowledge patterns (see Fletcher 1995) between houses at Çatalhöyük. I argue that the physical boundaries between certain households, were also cognitive and sensorial boundaries that directly correlate with power-play tensions growing and subsiding at the settlement.

08 A MEANINGFUL CONTEXT. PATTERNS FOR PLACING DEAD AT THE NEOLITHIC ANCIENT NEAR EAST

Author(s): Harabasz, Katarzyna (Adam Mickiewicz University)

Presentation Format: Oral

Contextual data provides a synthetic and holistic approach to effectively studying the daily life of prehistoric humans. Context - as a product of social behaviour in the past - demonstrates the heuristic potential of literal and symbolic interpretation. Context involves material culture as well as significant representation of activity, creativity and complexity of human-human, human-thing actions in the past. Exploring the meaning of human actions can lead to determining what, if any, patterns places had to fulfill in order to become feasible places for the dead.

This paper aims to show the research potential in further developing patterns of placement for embedding the dead in specified contexts. The effectiveness and potential of this approach will be discussed using examples of the burials located under the house floors originating from the Neolithic period in Central Anatolia, which sets the chronological framework for two sites: Aşıklı Höyük and Çatalhöyük. This study can ideally distinguish the criteria and factors that influenced choosing interment locations for the deceased, because place is constructed through ongoing entanglement and therefore allowing to focus on temporal rhythm thus enabling proposition of various approaches. In doing so, the possibility exists to explore new dimensions in understanding specific spaces in the past.

09 KAZBURUN ARCHAEOLOGICAL MICRO-DISTRICT AS A MEANINGFUL PLACE OF THE SOUTHERN TRANSURALS

Author(s): Shcherbakov, Nikolai - Shuteleva, Iia - Leonova, Tatiana (Bashkir State Pedagogical University named after M. Akmulla, Laboratory of Method and Methodology of Humanitarian Research)

Presentation Format: Oral

Kazburun is an archaeological micro-district located in the Southern Transurals, limited by the rivers Urshak and Bely Kluch. It covers an area of 23.4 sq.km and it is a favorite place of habitation in the territory of the Southern Transurals from the Bronze Age and up to the present time. This territory comprises a group of 7 settlements, 8 burial mounds and 3 solitary mounds. The isolation of the Kazburun archaeological micro-district occurred on the basis of its characteristics as a micro-territory with a high concentration of archaeological monuments belonging to the Late Bronze Age, the Early Iron Age and the Middle Ages. The functional use of this territory's parts has remained unchanged until present time. Modern houses are located on the territory adjacent to ancient settlements, the modern cemetery adjoins the territory of ancient burial mounds. The area of recreation and festive events remained unchanged in the 19-20th centuries.

Kazburun archaeological micro-district can be characterized as a place having high concentration of both settlement and funerary monuments of archeology belonging to the Late Bronze Age. A complex of interdisciplinary research was carried out on the territory of Kazburun archeological micro-district: radiocarbon dating and AMS dating of the buried in Kazburun mounds, paleopedological analysis, petrographic and geochemical analysis of ceramics, metallographic analysis, paleozoological and paleoanthropological analysis and ADNA.

The conducted analyzes allowed to draw conclusions about the monuments of the Late Bronze Age of the Kazburun archaeological micro-district. This territory is the aggregation of the Late Bronze Age sites. It can be assumed that it is a ritual congregation, the Kazburun barrows are its center and the settlements are located around them. The population of the Late Bronze Age significantly changed the landscape of this territory, which led to the fact that the ancient inhabitants had to leave this territory.

10 NUCLEATED SETTLEMENTS AS ASSEMBLAGES: A REGIONAL NETWORK APPROACH TO DWELLING PLACES

Author(s): Fulminante, Francesca (University Roma Tre) - Witcher, Rob (Durham University)

Presentation Format: Oral

Dwelling places are the product of interactions among their inhabitants both within a site and among sites. Terrestrial routes, on the other hand, can be considered as the result of the interplay of multiple factors: they are essential for permitting inter-settlement cooperative processes (information exchange, trade, defense), and at the same time, they need some level of cooperation to be established. However, since their creation and maintenance require a not negligible amount of resources, transportation routes are affected by competing interests. We can think of each connection between a pair of places as the result of a negotiation that involves the two actors but that can also be influenced, to some extent, by "third parties" as, for instance, a political authority acting on a higher level.

In this paper we focus on terrestrial transportation communication networks in Pre-Roman and Roman central Italy as a case study. We investigate network properties of the system at a regional scale and then we zoom into the local scale to better understand the relationship between dwelling places and transportation routes. Where routes established to connect previously existing settlements? Where new settlements founded along pre-existing established long distance connections?

Some preliminary analyses seem to suggest that most of the important Roman roads running along relevant long-distance natural connections along the peninsula were already in use much longer before Roman time both as long stretches but also for small-scale local communications. Thus it might reveal almost impossible to disentangle the complex cause relationship between settlements and communication routes at a dwelling place.

11 ROMAN CIVILIAN VILLAGES (VICI) AS SPECIAL DWELLING PLACES IN THE SOCIO-ECONOMIC LANDSCAPE OF NORTH-EASTERN PANNONIA (HUNGARY)

Author(s): Simon, Bence (Institute of Archaeological Sciences - Eötvös Loránd University, Budapest)

Presentation Format: Oral

In Roman Pannonia a town's own territory over which it had administrative duties, was built up by pagi and the pagi of vici. The vicus was the basic territorial unit in the rural landscape the centre of which was a civilian village with a Romanised native population living in traditional houses and some Roman-style buildings. These villages were the socio-economic nodes of the town's surrounding landscape: they were the social meeting points for rural peasants, town dwellers and military persons, on occasions they functioned as religious centres of the pagi and their economic importance is highlighted by their superior placement in the landscape from an agricultural point of view.

Three vici were excavated in the past decades in the hinterland of Aquincum (Óbuda, Hungary), but the identification of further centres became only possible with GIS technologies and the careful evaluation of field walking material. In this paper the methods and criteria are presented, how on one hand regional and interregional material helped the identification of vici and on the other hand the application of M. Chisholm's study on pre-mechanized intensive land use assisted in the statistical evaluation of their economic

importance.

The development of the vici from native villages to micro-regional centres will be addressed in the second part of the paper. It will be outlined that the settlements' superior agricultural prospects and the mode of production gave the essential meaning to these places in the landscape which culminated in the wide-range social and economic ties with the town of Aquincum and the military along the limes.

12 MAKING, MODIFYING, MOVING: GEOARCHAEOLOGICAL CONTRIBUTIONS TO UNDERSTANDING THE ACTOR NETWORKS OF VIKING-AGE FARMSTEADS IN THE NORTH ATLANTIC REGION

Author(s): Milek, Karen (Department of Archaeology, Durham University)

Presentation Format: Oral

Actor Network Theory (ANT) provides useful conceptual and analytical tools for archaeologists who wish to explore the entangled, dynamic web of relations between human and non-human actors in the past, and the practices that carry them. By scrutinising and characterising the relational ties between humans, animals, things, and landscape elements, and treating all of these actors equally, this material-semiotic approach to the analysis of archaeological remains and their landscape contexts can help to clarify the roles played by different mediators in the processes of making, modifying, and moving dwelling places. As scientists deeply involved with the analysis of site formation processes, construction materials, the physical layout of settlement sites, living conditions in buildings, the routine/common/sporadic/rare practices that took place in different activity areas, and human-animal-environment interactions, geoarchaeologists regularly contribute to the improved understanding of the biographies and meanings of places. However, it is rare for geoarchaeologists to engage directly with theoretical concepts, including the analytical tools of the ANT approach. Using examples drawn from the geoarchaeological study of Viking-Age farmsteads in the North Atlantic region, this paper explores the benefits of a conscious and systematic engagement with ANT by geoarchaeologists. An explicit use of ANT concepts, such as the principle of 'generalized symmetry' in the analysis of soils, sediments, and earthen building materials, and the distinction between 'intermediary' and 'mediator' actors, can enable geoarchaeologists to contribute to a more nuanced understanding of the processes of emplacement and abandonment, the relative significance of materiality and design, and the dynamism of dwelling places.

13 ROCKSHELTERS IN WESTERN NORWAY. SUITABLE DWELLING PLACES FOR 11TH-17TH CENTURY (AD) FOLKS?

Author(s): Hansen, Gitte - Bergsvik, Knut Andreas (University Museum of Bergen, University of Bergen)

Presentation Format: Oral

Rockshelters are numerous in the rocky and mountainous landscapes of Norway. The shelters are created as a result of geological processes such as erosion in geological fault-zones or because of rock-fall. There are also large numbers of boulder rockshelters with enough space underneath for human occupation. Rockshelters were used extensively as dwelling places in Norway during pre-history, and less extensively during the Middle Ages. In medieval written sources and later folklore rockshelters have negative and even scary connotations, and based on literary sources some researchers have related the places to poor people. But how were the shelters used according to the archaeological data? In this paper we address the use of 11th-17th century rockshelters as dwelling places in western Norway in coastal areas as well as in the fjords and in the mountains. Data from the medieval and early modern shelters has been collected through cross-disciplinary field work, and the study of archives and museum collections. To what extent were the shelters used as dwellings? What kind accommodation are we talking about? Were the places reshaped and modified to accommodate people in a suitable way? Who were the shelter users in terms of social identity, and what did they do here?

a. IF THE WALLS COULD TALK: ELEMENTS OF ROMANITAS AND PROVINCIAL PARTICULARITIES IN THE ROMAN HOUSES OF THE VALENCIAN TERRITORY.

Author(s): Peñalver, Tamara (Dpto. Prehistoria, Arqueología e Historia Antigua, Universidad de Valencia)

Presentation Format: Poster

Dwellings are the best reflection of the inhabitant's identity, where their cultural background remains fossilized, consciously or unconsciously, in its architecture, decoration and organization of spaces.

The aim of this poster is to assess how the Valencian territory (Spain), an area of early Romanization with a strong Iberian substrate, assimilated and adapted the Roman *modus vivendi*, which was associated with a series of activities, rites and interactions with the environment, through phenomena of imitation and resilience. In order to do it, we will conduct a theoretical review of the evidence used, giving greater weight and independence to the archaeological evidence over classical sources and over the Vesuvian premise, supposed fossils of an ideal type of house, currently overcome by research.

We will analyze what makes a roman house, "roman", through a statistical study that will use, as a leitmotif, the typical distributional spaces such as atria, peristyles or open courts. These spaces were sources of light, ventilation and water, associated with the concepts of axiality and symmetry. We will also discuss about the different factors that intervene in a house's construction, such as the buildable space, the topography and the owner's tastes and economic level.

Finally, we will rethink the need and utility of creating typologies in order to classify domestic environments and which kind of information we can extract from them about cultural and social processes, such as, in this case, the interaction between Rome and its

provinces.

In conclusion, we will research about common or typical factors, transmitters of romanitas, and about exceptional elements, derived from the hybridization with the pre-Roman indigenous substrate, that make the houses unique, encapsulating the essence of their inhabitants.

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ROADS OF THE NORTH. MEDIEVAL AND EARLY MODERN INFRASTRUCTURE OF TRAVEL AND EXCHANGE IN THE FAR NORTH

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Spangen, Marte (University of Tromsø) - Salmi, Anna-Kaisa (University of Oulu) - Äikäs, Tiina (University of Oulu) - Fjellström, Markus (Stockholm University)

Format: Regular session

The far north was a significant source of sought-after products during the Middle Ages and Early Modern Period. Fish, fur, hides, train oil, and walrus ivory are only some of the products known to have been distributed to other parts of Europe and beyond. Aspects of this trade and the exchange networks have long been studied through traditional archaeological methods. Over the last few decades theoretical developments have led to interesting new results and reinterpretations of the archaeological record, for instance regarding the complexities of social networks and identities in the medieval and early modern north. Recent developments in scientific methods, such as aDNA and isotope analyses, now provide unprecedented possibilities to trace the movements of people, animals and things in these contexts in more detail. In an environment with limited historical sources or physical constructions related to travel, such studies also provide new approaches to the materiality of internal routes of communication and meeting places in northern landscapes. This session will present current research on the medieval and early modern exchange networks of the north, the practical infrastructure of travel and exchange, including land routes, waterways, and means of transportation, and the mercantile, administrative, and religious meeting places. Furthermore, we welcome studies of the social and cultural negotiations this infrastructure and its integrated multispecies webs entailed, particularly concerning the perception and use of landscapes by the different cultural and ethnic groups engaged in these networks.

ABSTRACTS

01 ROADS OF THE NORTH - AN INTRODUCTION

Author(s): Spangen, Marte (University of Tromsø)

Presentation Format: Oral

This session deals with the wide topic of production, trade, travel, and exchange, as well as meeting places, negotiations, and social encounters in the far North of Europe during the Middle Ages and Early Modern Period. The abundance of products and raw materials that originated from these areas attests to the level of activity we should expect here. The archaeological traces of this activity have been explored to some extent, but recent methods and theories have provided new approaches and questions that are still to be investigated in full depth. Current research consequently includes the use of aDNA and isotope analyses, LiDAR data, and GIS, as well as more traditional historical and archaeological methods.

The submitted papers for the session cover a highly interesting width of geographical areas, archaeological records, and research questions within the proposed topic. What they share is an interest in mapping the more ephemeral aspects of the frequent interactions in the North, concerning the movement of people, animals, and objects through landscapes, and the more or less temporary mercantile, judicial, and religious meeting places these movements entailed. While these may sometimes have changed over the course of a lifetime, there are also patterns that prevail over generations and centuries. Thus, the session may be said to concern the effects and temporalities of different movements in the landscapes of the North.

02 THEORY AND METHODOLOGY FOR ASSEMBLY SITE IDENTIFICATION AND ANALYSIS

Author(s): Sanmark, Alexandra (Institute for Northern Studies, University of the Highlands and Islands)

Presentation Format: Oral

This paper will discuss the interdisciplinary approach developed Viking-age assembly (thing) sites in Scandinavia, but also in Norse settlements in the west, above all in the North Atlantic area. Until the early 2000s, the study of these assembly sites was rather limited and no in-depth investigation of thing sites had been carried out. Existing overview publications of the Viking Age contained some discussion of the major assembly-sites, such as Þingvellir in Iceland or the Gulathing in Norway. However, these were exceptions and local thing sites had rarely been investigated. Some research based on the written sources was also carried out in the first half of the twentieth century, when scholars produced lists of thing-sites for the local assembly districts, using late medieval court records. At this time, a few scholars discussed the traits and features of a small number of assembly sites.

In order to overcome these issues, an integrated approach where all documentary sources were reviewed together with archaeo-

logical evidence and topographical information was developed. Supplementary material was retrieved from antiquarian accounts, aerial photography, LiDAR data, historic maps dating from the seventeenth century onwards, as well as oral traditions. In addition, all sites were entered into ArcGIS, together with data from National Sites and Monuments Records, administrative divisions, as well as topographic information. In this way, large data sets were transformed into visual representations on maps, which has exposed spatial patterns and relationships, and as a result, a large number of new thing-sites have been pinpointed and analysed in detail.

03 NORTHERN JOURNEYS: COD, WALRUSES AND ARCTIC CONNECTIONS TO URBAN EUROPE IN THE MIDDLE AGES

Author(s): Barrett, James (Department of Archaeology, University of Cambridge) - Boessenkool, Sanne (Department of Biosciences, Centre for Ecological and Evolutionary Synthesis, University of Oslo) - Kneale, Catherine - O'Connell, Tamsin (Department of Archaeology, University of Cambridge) - Star, Bastiaan (Department of Biosciences, Centre for Ecological and Evolutionary Synthesis, University of Oslo)

Presentation Format: Oral

This paper explores the role of trade in dried cod (stockfish) and walrus ivory in the 'globalisation' of the medieval Arctic. When did these products first enter urban markets around the Baltic, North and Irish Seas? Where did they come from? Via what routes? What can ebbs and flows in their popularity tell us about shifting socio-economic circumstances in the far north and urban 'south'? Who were the producers? Moreover, what can we discover about the interaction of European and Arctic peoples from the distribution of these resources? What agency resided with indigenous hunters and fishers? To help answer these questions, we combine archaeological studies of fish bones, and of walrus ivory and bone artefacts, with ancient DNA and stable isotope analysis. We focus on finds from Norway, Ireland, Britain, France, the Netherlands, Denmark, Germany and Sweden – and also consider material from potential source regions ranging from the Barents Sea area in the east to Greenland in the west. There are major differences in the chronology of trade and transport between regions, and between materials. These divergences reveal transformations in the nature of trade networks, the shape of political geography and the perception of social space in the Middle Ages. They also reveal the growing demand placed on distant natural resources during medieval demographic and economic growth.

04 TANGLED WORLDS: THE SWEDISH, THE SÁMI, AND THE REINDEER IN MEDIEVAL AND EARLY MODERN NORTH

Author(s): Salmi, Anna-Kaisa (University of Oulu)

Presentation Format: Oral

The use of draught and cargo reindeer allowed the efficient movement of people and things in the Medieval and Early Modern northern Fennoscandia. Reindeer pastoralism, as well as the use of reindeer as a means of transportation developed among the indigenous Sámi, but tradesmen, priests, and officials of Swedish origin benefited from domesticated reindeer in many ways – trading reindeer products and using reindeer as transport during winter trips to market places. Reindeer were therefore in many ways focal in the encounters between Sámi and the Swedish.

In this paper, I will discuss reindeer bone finds from towns, market places and agrarian settlements in Medieval and Early Modern northern Finland (at that time a part of the Swedish kingdom). I will argue that reindeer played important roles in the contacts and encounters and that together, the Sámi, the Swedish, and the reindeer formed a multispecies community. In the northern landscape, cooperation with reindeer and their herders was essential for carrying out a range of activities including trade and professional responsibilities. Close-knit relationships formed between humans and reindeer they were dependent on and worked with. Transport reindeer were therefore active agents in shaping the relationships between the Sámi and the Swedish.

05 METHODS OF RECONSTRUCTING MEDIEVAL INFRASTRUCTURE BY HISTORICAL AND ARCHAEOLOGICAL SOURCES

Author(s): Møller, Per Grau (University of Southern Denmark) - Haue, Niels (Historical Museum of Northern Jutland)

Presentation Format: Oral

Documenting infrastructure on land surface, i.e. roads, in periods without written sources is a very challenging discipline. This paper will systematically try to analyse different sources within landscape archaeology in order to reconstruct infrastructure. The case area is the landscapes around the later Danish cities Odense (Funen) and Aalborg (North Jutland). Archaeological relics of roads are very few, relics of bridges are more often documented, especially from the medieval period. But anyhow, it leaves us with a very fragmented picture. Written historical sources can give a little deeper knowledge of how people were travelling. Especially maps can give a fuller view of infrastructure, but cartographical sources are only precise from the end of the 18th century even though we have maps from the 17th century which can give ideas of the passage of roads. So, we are left with retrospective landscape studies of infrastructure, which is seen as a hypothetical way of reconstruction. Another way can be to correlate potential roads to archaeological relics as burial mounds, runic stones and central places found by metal detectors. This will be analysed. Furthermore, one hypothesis should be proposed: lack of infrastructure is the explanation why the diocese of North Jutland was situated at the monastery of Børglum and not in the city of Aalborg, where it was moved to after the reformation.

06 TRAVEL, ENCOUNTERS, AND SOCIAL NEGOTIATIONS IN MEDIEVAL NORTHERN NORWAY

Author(s): Spangen, Marte (University of Tromsø)

Presentation Format: Oral

Troms and Finnmark counties in the far north of Norway were mainly populated by Sámi groups during the Middle Ages. However, several other groups frequently entered into, stayed, and increasingly settled in these areas too. This mainly concerned Norse/Norwegian, Russian, and Swedish representatives, or Icelandic, Karelian, and so-called Birkarla parties on their behalf. The regular interaction between them and the Sámi was initially related to taxation and trade. With the increased integration of these areas into Danish/Norwegian, Swedish and Russian state interest spheres in the 16th and 17th century, judicial and religious administration became important aspects of the encounters with the Sámi.

Historical sources indicate that the taxation and trade relations entailed prolonged journeys into the vast inland mountains and plains to meet with the Sámi. Yet, the practicalities of these travels and location of the meeting places remain somewhat unclear. This paper explores how we can establish the infrastructure of these activities on a regional and local level through a combination of cartographic, other historical, toponymic, and archaeological evidence. These sources are used to discuss the travel routes and camp sites of non-Sámi groups, as well as the relation between medieval Sámi habitation sites and use of the landscape and the later established thing, church, and market places. It is argued that the chosen locations for these activities reflect the social negotiations that were necessary to institute meeting places, exchange relations, and forms of administrative control that were acceptable to both Sámi and non-Sámi participants.

07 TRADER SOCIETIES IN THE BOTHNIAN BAY COAST DURING THE 14TH-16TH CENTURIES AD

Author(s): Nurmi, Risto - Kuusela, Jari-Matti - Hakamäki, Ville (University of Oulu)

Presentation Format: Oral

This presentation investigates the manner in which the trading network in the Bothnian Bay region worked during the Middle Ages. Archaeological research has shown that, despite earlier beliefs, the coastal societies in the north were not the result of colonisation efforts, but of local provenience. This implicitly means, that these societies were a significant factor in the medieval trade of the northern Baltic which was of great importance for the Kingdom of Sweden, Hanseatic League and the Republic of Novgorod. However, as there are very few archaeological signs of hostile takeover or colonisation during this time, the local societies must have held a position where they became immune to such attempts at takeover. It is argued in this presentation, that this strong position was due to an amalgamation of several factors – both natural and social – which enabled the coastal traders to maintain a gateway position in the north making them an indispensable middleman in the northern trade. This middleman position was largely based on the control of an immaterial resource – information – and not material resources. Based on the analysis of both archaeological data and known conditions of the north, we form our argument, that in the north, information control played a key-part in all human interactions – trade included.

08 FROM TRADE TO CHURCH SERVICES: HISTORY AND EXCAVATIONS OF KOLARI MARKET PLACE IN NORTHERN FINLAND

Author(s): Äikäs, Tiina - Salmi, Anna-Kaisa - Nurmi, Risto (Archaeology, University of Oulu)

Presentation Format: Oral

In 1818, a church was built on an island in Kolari after the border between Sweden and Russia had been moved to River Torniojoki in 1809 hence dividing the linguistically and culturally uniform area. The church place was chosen on the southern end of the island where prior to the church an old market place had been located. The market places in Lapland served as meeting points for tradesmen exchanging southern commodities to northern goods. Written sources state that in Kolari tradesmen from different parts of Finland met.

The early dating of the market place is uncertain but written sources indicate that the trade activities ceased in the later part of the 19th century and after that the buildings were removed and reused in other purposes.

In summer 2018, archaeological excavations will take place at the market place. The excavations will help us to answer following questions and the results will be presented in this paper: What does the archaeological material tell us about the movement of people and their contacts? Has the later border of the nation states affected the material culture? Is the later use as a church place evident in the archaeological finds? In this paper, we highlight the changes in the landscape of trade and contacts brought by the varying uses of a place.

09 BUSINESS AND BURIAL IN SILBOJOKK: AN ISOTOPE APPROACH TO A SÁMI BURIAL GROUND

Author(s): Fjellström, Markus (Archaeological Research Laboratory, Stockholm University) - Lindgren, Åsa (Norrbottnens museum) - Eriksson, Gunilla - Lidén, Kerstin (Archaeological Research Laboratory, Stockholm University)

Presentation Format: Oral

North of the Arctic Circle, at the Swedish/Norwegian border, silver and lead ore was discovered in 1634. One year later, both the silver mine of Nasafjäll and the community of Silbojokk (one of the first parishes in the Swedish mountains), some 44 km further away, had been established. The latter included a smeltery, a church and a churchyard as well as living quarters. Non-local specialists and farm-

ers from the coast were employed at the mine and the smeltery, while local indigenous Sámi were engaged to transport ore, staff and supplies between the mine, the smeltery and the coast. The mining activities ended in 1659 as Danish/Norwegian soldiers burnt down, amongst others, the living quarters, the smeltery and church in Silbojokk but also other buildings related to mining activities at the mines in Nasafjäll. Yet, according to historic written sources ecclesiastical activities took place until 1770; mostly Sámi individuals were buried at the site. Through the use of carbon, nitrogen, sulphur and strontium isotope analysis ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$, $\delta^{34}\text{S}$ and $^{87}\text{Sr}/^{86}\text{Sr}$) and trace element analysis of the individuals buried, changes in diet and mobility at a regional level are studied. Moreover, the health of the buried individuals and exposure to lead is considered in relation to the smeltery and mining activities.

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TRANSFORMING INFRASTRUCTURES: SOCIO-ENVIRONMENTAL DIMENSIONS OF SITE AND SETTLEMENT PATTERN CHANGES

Theme: Theories and methods in archaeological sciences

Organisers: Fuchs, Katharina (Kiel University; CRC 1266 "Scales of Transformation") - Kadrow, Sławomir (Institute of Archaeology and Ethnology Polish Academy of Sciences; CRC 1266 "Scales of Transformation") - Müller, Johannes (Kiel University; CRC 1266 "Scales of Transformation")

Format: Regular session

Aim of the session is to reconsider specific triggers, factors or components of infrastructure transformations and related processes observed in the scale of archaeological sites. The attention is drawn to a more comprehensive understanding of the connectivity of social relations, culture, and economy, and natural environment revealed by intra-site infrastructures and underlying socio-environmental dynamics.

We welcome contributions addressing the practical application of environmental, social and cultural change theories on cases of infrastructure transformation processes observed in intra-site variability, including moments of crisis and collapse. The session intends to pursue a diachronic perspective on Neolithic to pre-state site infrastructures.

Quite often, researchers discover settlement units of different complexity enclosed within one archaeological site. Their main interest is to explore human infrastructures: remains of buildings, enclosures, production facilities, places of consumption, or the identification of economic, social and ritual activity areas. For providing the context of human behaviour, studying these infrastructures is accompanied by extensive investigations of the geographical setting and natural resources in order to reconstruct past environmental conditions. In many cases, the traces of human activity recorded at these sites give evidence of different occupation phases and thus the opportunity to study infrastructural change in time and space. Often, the variability of the assessed parameters points to random processes of change. In other cases, there are interdependencies of environmental and infrastructural parameters and trends can be detected.

Most of these changes are enduring and substantial, thus leading to various transformations, whose main characteristics shall be discussed in the contributing papers.

ABSTRACTS

01 DOMESTIC INFRASTRUCTURES AND TRANSFORMATION DYNAMICS

Author(s): Fuchs, Katharina (Collaborative Research Centre 1266) - Kadrow, Sławomir (Institute of Archaeology and Ethnology PAN) - Müller, Johannes (Institut fuer Ur- und Fruehgeschichte Kiel)

Presentation Format: Oral

"Quite often, researchers discover settlement units of different complexity within the same archaeological site. Their main interest is to explore human infrastructures: remains of buildings, enclosures, production facilities, places of consumption, or the identification of economic, social and ritual activity areas. Studying these infrastructures is accompanied by extensive investigations of the geographical setting and natural resources in order to reconstruct past environmental conditions. In many cases, the traces of human activity recorded at these sites give evidence of different occupation phases and thus the opportunity to study infrastructural change in time and space. Often, the variability of the assessed parameters points to random processes of change. In other cases, there are interdependencies of environmental and infrastructural parameters and trends can be detected." The description of this session abstract naturally emphasises open questions of the topic: Why are we interested in detecting transformation processes of domestic features? How and where can we identify "transforming infrastructures"? What is the potential of this approach regarding dynamics in the interplay of natural environment, economy, culture and social relations?

This introductory paper aims to set the frame for the following contributions by providing theoretical considerations about terminology and examples of practical applications on archaeological case studies.

02 COMMUNAL BUILDINGS IN CUCUTENI-TRIPOLYE SETTLEMENTS

Author(s): Hofmann, Robert - Müller, Johannes - Kirleis, Wiebke (Kiel University, Institute for Pre- and Protohistoric Archaeology; CRC 1266: „Scales of Transformation - Human-Environmental Interaction in Prehistoric and Archaic Societies”) - Videiko, Mihail (Borys

Grinchenko Kyiv University, Research Laboratory of Archaeology) - Burdo, Natalia (Kiev) - Ohlrau, René (Kiel University, Graduate School „Human Development in Landscape“) - Dal Corso, Marta - Dreibrodt, Stefan - Shatilo, Liudmyla (Kiel University, Institute for Pre- and Protohistoric Archaeology; CRC 1266)

Presentation Format: Oral

In recent years, high-resolution geomagnetic surveys in Cucuteni-Tripolye settlements led to the discovery of large, so far unknown building structures which are located at prominent positions within settlements. Due to their extraordinary size, positioning and special architectural characteristics these structures are interpreted as some kind of public or communal buildings such as temples or assemblage houses. Within large settlements two classes of such buildings can be distinguished: high-level ‘mega-structures’ for the whole settlement and low level ring- or pathway buildings for parts of the commune. The latter category of buildings, normally show regular distributions within settlements which likely reflect some kind of communal organisation.

In order to achieve better understanding of construction and functional aspects of such buildings, we excavated one of the low-level ring- or pathway building in the large settlement Maidanetske in the frame of a Ukrainian-German cooperation. Detailed collection of information regarding the finds and their context, of imprints of construction timber on daub, and the dense sampling for botanical, zoological, pedological, and geoarchaeological investigations should provide arguments for the evaluation of functional aspects of this building in comparison to ‘normal’ houses.

In order to understand transformations in the social organisation of Tripolye communities, we would like, on the other hand, evaluate such buildings in a diachronic perspective based on plans of geomagnetic surveys. Thereby, important aspects like frequency and positioning of within settlements and the size of the structures in relation to the use group size will be discussed.

03 TRANSFORMATION OF SPACE AND MATERIAL CULTURE IN TRIPOLYE SETTLEMENTS OF THE BUG-DNIEPER INTERFLUVE

Author(s): Shatilo, Liudmyla - Hofmann, Robert - Müller, Johannes (Kiel University, Institute for Pre- and Protohistoric Archaeology; CRC 1266: „Scales of Transformation - Human-Environmental Interaction in Prehistoric and Archaic Societies“)

Presentation Format: Oral

Based on the survey data we are looking on transformations in the organisation of space and material culture of Tripolye settlements in order to achieve a more comprehensive understanding of the Tripolye-mega-site phenomenon in a spatial and diachronic perspective. Regional focus of our paper is the Buh-Dnieper interfluvium, the region with the largest and the greatest concentration of mega-sites. Previous data collections in this region were frequently focused on mega-sites or settlements of the Tripolye late BII and CI period. New data, collected during the survey in spring 2017, in a cooperation between the National Ukrainian Academy of Science and Kiel University, included also settlements of earlier stages of the agglomeration process (Tripolye BI-BII and early BII) which resulted in the emergence of mega-sites. During this survey the sites from both “west” and “east” Tripolye pottery traditions were prospected in order to understand differences and similarities in respect of settlement layout, and other parameters. In this spatio-temporal framework, transformations of selected aspects are evaluated such as the arrangement of dwellings and special buildings, streets, kilns, and ditches. These aspects are compared to the development of pottery and some innovations (cargo sledges, kilns, mega-structures, etc.) in order to understand mutual relations.

04 THE VARIABILITY OF SETTLEMENT TRANSFORMATION PROCESSES IN THE SECOND HALF OF THE 5TH MILLENNIUM BC IN CENTRAL EUROPE

Author(s): Szilágyi, Márton (Hamburg University)

Presentation Format: Oral

When discussing transformation processes, researchers often draw an analogy between changes in settlement pattern and material culture changes. Consequently, creating settlement phases has been carried out many times on the basis of stylistic changes in material culture, or alterations in other cultural phenomena. As a result, the transformation of settlement patterns (either on an intra-site, or on a micro- or macroregional level) and the metamorphosis of material culture are generally seen as parallel to each other.

However, in numerous case studies the empirical observations contradict these inflexible frames. This paper focuses on some examples of the so-called Epi-Lengyel period (ca. 4500-4000 cal BC) in Central Europe, in which the relation between settlement changes and cultural changes can be studied. The most representative case is an enclosed settlement of the Münchshöfen Culture in Riedling, Lower Bavaria, where internal structural changes, cultural behaviour and stylistic alterations can all be studied and an integrative model can hence be built on these transformations from the community’s perspective.

This model can be compared to other case studies, drawn from the wider Epi-Lengyel area from the Carpathian Basin to Bavaria. Based on these stories a more varied image of cultural, stylistic and settlement pattern changes can be depicted, and there is an opportunity to create more flexible models, which involve human behaviour and communities’ attitudes towards innovations (or sometimes towards conservatism) as important factors. The aim of the present paper is to illustrate the variability and flexibility of such transformation processes.

05 CHANGES IN PRODUCTION, DISTRIBUTION AND CONSUMPTION IN THE FOURTH AND THIRD MILLENNIUM BC ON POLISH LOWLAND

Author(s): Szmyt, Marzena (Adam Mickiewicz University) - Czebreszuk, Janusz (Archaeological Museum in Poznań)

Presentation Format: Oral

In the fourth and third mill. BC important changes of settlement system took place on Polish Lowland. Their main consequence was formation of a network of dispersed, small (one-dwelling) and middle-sized (several-dwelling) settlements and camps. Interpretation of material evidence suggests that basic societal units were also small or medium-sized and basically they did not exceed 30-50 people. The major part of production, distribution and consumption took place in these small groups. This is confirmed in various productive activities (eg. in pottery making and using, flint knapping, and stone processing) as well as in distribution and consumption patterns. Both daily needs and the corresponding domestic infrastructure (eg. buildings, wells, production facilities etc.) had to transform in line with new social solutions. One of the most important changes consisted in deep adaptation to local raw material resources which caused appropriate changes in the technologies used. Thus, the basic agents of production, distribution and consumption were small groups of people that integrated into larger communities only on a cyclical basis. At the same time, however, there were also such activities, which included larger communities, composed of several or a dozen or so basic groups and required having access to rare and exotic goods. In sum, it can be argued that for the long existence of these small and dispersed communities the most important was a kind of balance between two opposite socio-environmental processes: on the one hand it was the daily and almost perfect adaptation to the local milieu which could cause an increasing isolation of individual groups, and on the other hand they were deep social needs resulting in breaking down this isolation.

06 WEAVING LOOMS, INTENTIONAL DEMOLITIONS, BURNT OFFERINGS...? TRENCH-LIKE FEATURES OF THE URNFIELD PERIOD IN CENTRAL EUROPE

Author(s): CHvojka, Ondrej (University of South Bohemia) - Menšík, Petr (University of West Bohemia) - Šálková, Tereza (University of South Bohemia)

Presentation Format: Oral

Recent research of settlements of the Late and Final Bronze Ages (1250–800 BC) in South and West Bohemia, South Germany and Austria has repeatedly provided examples of a peculiar type of settlement feature: long or short trenches filled with specific archaeological contents. Opinions on the original function of these features differ: they are considered either foundation trenches of weaving looms, features associated with pottery production or specific cult objects. The main aim of our poster is to reconsider the interpretation possibilities of these features and the processes which led to their specific appearance in the archaeological record. Until now, 51 linear trench-like features from 22 sites have become known so far (in South and West Bohemia, Bavaria, Baden-Württemberg, Lower Austria and Salzburg). These features usually appear to have been separate in space; however, it is not excluded that they originally belonged to a specific type of above-ground structure. Usually, the features are oriented according to the cardinal points (north-south) and their length (usually 4–7 m) is about four times their width (80–100 cm). Most of them were filled with (secondarily) burnt pottery, clay weights, stone artefacts etc. Typically, there are about 3–5 of these trench-like features per site. The highest number of them was found at Březnice near Bechyně (South Bohemia) – the analyses of finds of this site can help us to interpret the function of these specific linear features.

07 PATTERNS OF CULTURAL SPACE FROM THE NEOLITHIC TO THE MIDDLE AGES AT THE SITE NO. 3 IN MIECHÓW (SOUTHERN POLAND)

Author(s): Nowak, Marek (Institute of Archaeology, Jagiellonian University) - Przybyła, Marcin (Pryncypat, Kraków) - Rodzińska-Nowak, Judyta - Wojenka, Michał (Institute of Archaeology, Jagiellonian University)

Presentation Format: Oral

Human societies organize space according to the requirements of both the biological determinants of human beings as well as the geographical, economic, social, and ideological ones. All these factors are interdependent and linked by a complex network of feedbacks. As a result, physical space is converted into a cultural space. The final shape of the cultural space (its social geography) is reflected in the structures and contexts of settlements. Hence, preserved remains (artefacts and ecofacts) of prehistoric and historic settlements enable reconstructions of the formation, functioning, and transformations of a cultural space.

Results of archaeological investigations conducted recently at the site no. 3 in Miechów (district of Miechów, Lesser Poland voivodeship), situated in the loess Miechów Upland, offer an opportunity for such reconstructions, in a unique, diachronic perspective of almost 7,000 years (ca. 5400 BC – 1300 AD). In the area of 4 hectares more than 3,000 anthropogenic features and, in some parts of the site, preserved cultural layers were recorded. The site was settled in the Neolithic (Linear Band Pottery culture; Lengyel-Polgár Complex; Funnel Beaker culture; Baden culture), Bronze Age (Mierzanowice, Trzciniec, and Lusatian cultures), pre-Roman and Roman Period (Przeworsk culture), and in the Middle Ages.

Model reconstructions of the cultural space, organized by inhabitants of successive settlements at Miechów 3 will be presented. The interdisciplinary perspective will allow reconstructing: i) functions of the subsequent settlements, ii) the existence of universal and specialized activities (activity areas), iii) catchment areas, and iv) household and community levels of past human activities. By comparing models developed for the subsequent phases of the site occupation a dynamic picture of changes and trends of settle-

ment, economic, social, and ideological structures in the environmental context of loess upland will be proposed.

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“SCALING” CHALLENGES FACED BY FIRST MESOLITHIC SOCIETIES: TECHNOLOGICAL CHANGES AT THE BEGINNING OF THE HOLOCENE

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Soto, Adriana (University of Basque Country) - Marquebielle, Benjamin (University Toulouse Jean Jaurès) - Visentin, Davide (University of Ferrara)

Format: Regular session

The very end of the Pleistocene and the beginning of the Holocene is characterized by both climatic amelioration and rapid evolution of the European cultural landscape. How these changes occurred as well as their palaeoethnographic consequences are currently at the centre of debates concerning the evolution of European hunter-gatherer lifeways. At the beginning of the Holocene a demographic pulse has been documented that is often associated with an expansion of dietary diversity. These conditions, along with the novel environmental context, were undoubtedly important driving factors affecting both the economic and social organization of these last hunter-gatherer groups. The objective of this session is to investigate these changes as documented by the study of material culture and the reconstitution of past technical behaviours in the broadest sense (tool/toolkit production and use, hunting and subsistence strategies, art and symbolic aspects, settlement organisation, etc.). We particularly welcome case studies and regional syntheses focusing on south-western and central Europe. The ultimate goal is to build from local to global: beginning with the regional evidence, we hope to identify regularities that would allow us to propose varying scales of Pan-European change, as well as explore the tempo of these changes within and between regions.

ABSTRACTS

01 INVESTIGATING PITS IN THE IRISH MESOLITHIC

Author(s): Small, Jonathan - Basell, Laura (Queen's University, Belfast) - Woodman, Peter (University College Cork)

Presentation Format: Oral

The Mesolithic site of Mount Sandel provides evidence for the earliest settlement in Ireland (Woodman 1985). As well as a number of circular huts, many pit and post-hole features were excavated, of varying size, shape, depth and profile. This poster presents initial results from ongoing research identifying potential uses of these features. Pits/postholes are common features on Mesolithic sites in Ireland, but they have received limited research attention. The Mount Sandel pits have been digitised using ArcGIS, and a variety of attributes have been used to identify differences and relationships between features. The contents and nature of each feature have also been explored. Identifying the function of these pits has important consequences for the characterisation of Mount Sandel as a “base camp”, as described by Woodman (1985). Analysis of these features addresses questions concerning storage, structures, settlement and social organisation, and has important implications for the degree of sedentism in Mesolithic hunter-gatherer communities. The data are used to consider the concept of “place”, and how places become “persistent”, as well as the concept of prehistoric territories. The broader remit of this research includes a multi-isotope analysis of wild boar teeth from Irish Mesolithic sites, assessing their mobility in the landscape, foraging strategies and potential consumption of human food-waste resources. The combined approach of the Mount Sandel storage study and isotope analysis will build a broader picture of Mesolithic subsistence strategies.

02 ON THE ONSET OF THE EARLY MESOLITHIC ON THE NORTH GERMAN PLAIN

Author(s): Groß, Daniel - Grimm, Sonja - Weber, Mara-Julia (Centre For Baltic And Scandinavian Archaeology - ZBSA)

Presentation Format: Oral

Rapid climate change led to drastic changes in the environment during the Early Holocene. Ensuing changes in vegetation and fauna are observable through various proxies such as macro- or microbotanical remains as well as animal bones. On the North German Plain, changes in the archaeological record are associated with this period: the transition from the Ahrensburgian to the Early Mesolithic technocomplexes. In general, this transition was explained by hypotheses that suggest replacement or adaptation processes (including diffusion of ideas and people) behind those differences.

For example, the occurrence of similar Mesolithic technocomplexes further south led to the suggestion that the Mesolithic arose there and spread northwards with the expansion of forest environments. The forest expansion onto the North European Plain replaced the tundra environments and drove off the large reindeer population living there. The hunter-gatherer groups associated with the Ahrensburgian technocomplex moved further north with this open environment and, hence, left space for the Mesolithic people to replace them in this area. This narrative also fits well with the widely adopted distinction that the Palaeolithic ends and the Mesolithic begins with the onset of the Holocene. In contrast, adaptation hypotheses considered the development of the Mesolithic as grounded in the Ahrensburgian technocomplex.

Using chronological data, we are going to discuss a basic fundament of the advent of the Mesolithic: the timing of the disappearance of the Ahrensburgian and the appearance of the Early Mesolithic. Approaching this point helps to answer the question how useful the distinction along a geological, climatic, and environmental limit (Pleistocene/Holocene transition) really is for cultural entities/epochs as the Palaeolithic and Mesolithic.

03 BONE TOOLS OF THE EARLY MESOLITHIC IN THE SOUTHERN HALF OF FRANCE (AND BEYOND): RECENT SYNTHESIS AND NEW PERSPECTIVES

Author(s): Marquebielle, Benjamin (UMR5608 TRACES; Toulouse Jean Jaurès University)

Presentation Format: Oral

The work of osseous materials is a key area in the economy of human prehistoric societies, right at the start of the Upper Palaeolithic: bone tools could be in particular a vector of technical innovations or graphic expression. The study of the prehistoric societies, from the evolution of their technical traditions to the reconstitution of their social structures, can't be efficient unless the work of osseous materials was taken into account, as far as possible.

Concerning Mesolithic groups in the French territory, very little was known about this part of material culture. A recent study brought new elements: the results suggest that Mesolithic bone tools in Southern half of France were mainly linked with domestic or processing activities, but only a little with hunting or symbolic activities. It is particularly interesting to note that Mesolithic groups, throughout this territory, shared the same types of tools, with very few chronological and geographical changes – some technical traditions could even be seen as strong cultural signature.

This homogeneity of the work of osseous materials could reflect a kind of chronological and geographical cultural homogeneity, whereas study of lithic production show very different evolution rhythms.

Could the study of bone tools bring constructive elements to understand the beginning of Mesolithic time? This presentation – focused on southern half of France, but with a beginning of broader geographical contextualisation – has two aims. Firstly make a synthesis about Early Mesolithic bone tools. Secondly, deal with the evolution of technical traditions using a different (and complementary) point of view than the one provides by study of lithic industries. The final objective is to address social and economical changes at the beginning of Mesolithic time in a new way.

04 A TECHNOLOGICAL ASSESSMENT OF EARLY MESOLITHIC TRADITIONS IN NORTHERN ITALY, SOUTHERN FRANCE AND NORTH-EASTERN SPAIN

Author(s): Soto, Adriana (University of the Basque Country) - Visentin, Davide - Fontana, Federica (University of Ferrara) - Valdeyron, Nicolas (University of Toulouse Jean-Jaurès) - Alday, Alfonso (University of the Basque Country) - Domingo, Rafael - Montes, Lourdes (University of Zaragoza)

Presentation Format: Oral

At the end of the 1920ies Laurent Coulonges identified and defined the Sauveterrian as one of the main Early Mesolithic cultures of southern France. According to the author the Sauveterrian was characterized by the presence of small backed points and triangular microliths, as well as by the use of the microburin technique. In the 1970ies several archaeological assemblages were discovered in the neighboring countries and linked to the French Sauveterrian in light of techno-typological affinities. In particular it is worth mentioning the work of Alberto Broglio in north-eastern Italy and of Javier Fortea in the Iberian Mediterranean basin. Since then, several works dealing with the techno-economic characterization of these assemblages were published but most of them were focused on a regional perspective. Only recently a comparison between French and Italian Sauveterrian was attempted and allowed highlighting the presence of, at least, two main different areas of influence.

In this paper the state of the art concerning the Early Mesolithic lithic assemblages of north-eastern Spain, southern France and northern Italy will be presented, starting from a critical re-examination of both the archaeological record and the available radiocarbon dates. The aim is to quantify the extent of shared technological traditions and investigate the relationships between these three regions at a Western European scale.

05 TO BE OR NOT TO BE SAUVETERRIAN: THE EMERGENCE OF THE FIRST GEOMETRIC TOOLS IN MEDITERRANEAN IBERIA.

Author(s): Roman Monroig, Didac (University of Barcelona)

Presentation Format: Oral

From ca. 11000–10000 BP (ca. 13000–11700 cal. BP) in Mediterranean Iberia and in a context marked by an end-scraper/backed bladelet-point duality clearly related to the Epimagdalenian, the emergence of early geometric elements has been detected. These include some segments and triangles. However, in quantitative terms, they play a minor role when compared to backed tools. Their presence, which later experiments a slight increase, suggests changes in the design of one part of the stone tools. These changes have been traditionally associated with the Sauveterrian complex. However, recent research studies have suggested a potential link between these changes and the microlaminar complex (Epimagdalenian) rather than with the geometric complex (Mesolithic).

This presentation analyses the industrial data of key sites in Mediterranean Iberia providing this type of materials and conducts an in-depth assessment of the available information to shed new light on this debate. Comparisons of the resulting data with those

from French Sauveterrian sites, seem to suggest that the early emergence of geometric stone tools in this region is related to the microlaminar complex (Epimagdalenian), and not necessarily to the Mesolithic or the Sauveterrian, as appears to happen in the areas north of the Pyrenees (or as understood in the areas north of the Pyrenees). The implications of such an observation will be also discussed.

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NAVIGATING IN A SEA OF DATA. TRADE IN THE ANCIENT MEDITERRANEAN

Theme: Mediterranean seascapes

Organisers: Remesal Rodríguez, José (CEIPAC, Universitat de Barcelona) - Fabiao, Carlos (Universidade de Lisboa) - Martín-Arroyo Sánchez, Daniel Jesús (CEIPAC, Universitat de Barcelona) - Bermúdez Lorenzo, Juan Manuel (CEIPAC, Universitat de Barcelona)

Format: Regular session

Trade was an essential factor in the construction of inter-community relations around the Mediterranean. Research depends on a limited and evenly sampled series of data that increases gradually as archaeological discoveries continue. The management of all this information involves the creation of databases. These databases must accommodate the complex and fragmented nature of archaeological evidence. They must also be intelligently structured, anticipating the requirements of historical research. Questions can be formulated as long as the databases are correctly tested and accessible. This EAA session proposes a joint discussion of this entire research process, that combines four strands of research: data collection, analysis, interpretation and dissemination.

The interpretation of data depends on documentary sources, the spatial distribution of data points and the wider socio-political understanding. Sources raise questions about the material that has been preserved in the archaeological record. These consist basically of pottery (tableware, flashlights, amphorae, etc.), metals (ingots, coins, etc.) and building materials (marbles, tegulae, laterculi, etc.). The information provided by these objects is increased when they bear inscriptions. Therefore, this session will focus on epigraphic and numismatic studies. Spatial perspectives on supply, transport and distribution areas are also of interest, with attention to ports and trade routes. In this sense, we are especially interested in stamps, tituli picti and graffiti and other inscriptions, but also in concentrations of materials such as wrecks and dumps. Finally, studies on communities and institutions directly related to trade can also provide useful insights, especially, considering lapidary epigraphic databases.

ABSTRACTS

01 AN INTRODUCTION TO THE DATA MANAGEMENT ON ANCIENT TRADE

Author(s): Remesal Rodríguez, José (Universitat de Barcelona)

Presentation Format: Oral

The Mediterranean basin witnessed a dynamic evolution of societies in ancient times. Trade was one of its main causes and consequences, increasing their interdependence. This session deals with the problem of generating and continuing a solid investigation. An investigation that must be based on a large volume of data and formal hypothesis testing. The whole process should be in line with coherent planning. Technological progress and the evolution of research keep this perspective open, with the creation of new databases and the revision of the operational ones. The construction of a database requires the use of protocols for including bibliography and unpublished documents. About this, the CEIPAC's expertise on the management of his amphoric epigraphy database provides a backgrounding model. Nowadays, specialized software and appropriate ontological designs are required for integration into accessible and interconnected online platforms. These databases should allow the application of traditional and emerging analytical methods. Issues such as quantification techniques, network analysis or modelling (using geographic information systems or agent-based modelling) are the natural "next stages". In this sense, historians, physicists, and computer scientists work together in the EPNet project, by developing new approaches on the management of data and the theoretical interpretation of ancient economy.

02 'CASA DA BICA' COIN HOARD RESEARCH FRAMEWORK: DATABASE INFRASTRUCTURE AND KNOWLEDGE EXTRACTION

Author(s): Botica, Natalia - Machado, Diego - Martins, Maria Manuela - Magalhães, Fernanda - Ribeiro, Jorge (University of Minho)

Presentation Format: Oral

The circulation of people and wares inside the roman borders, by land and through Mediterranean and Atlantic shores, stimulated also the circulation of a huge amount of coins needed to trade, to pay taxes and salaries, to build and reform constructions, to import and export materials, products and services between cities, provinces and regions. The study of coins is an important way to access to signs of the economic processes of the classical world in order to identify periods of acceleration or stagnation that leave traces in the quantity and quality of currencies in circulation, which can be evaluated by the monetary treasures or the loose coins found in excavations carried out in urban areas.

During the excavation campaign carried out in 2015 on the surrounding area of the Roman theatre of Bracara Augusta (Braga - Por-

tugal) was identified a hoard composed by 371 bronze coins minted between III and V centuries A.D.

The 2ArchIS digital platform of the Archeology Unit of the University of Minho was used to record this data, using data standards and following proper procedure to guaranteed integration into the archaeological context. This methodology allows us to make quantitative and qualitative analyzes of the data, as well as micro and macro spatial analysis. It also allows the interoperability to external research infrastructures and the easily dissemination and reuse of data to the archaeological research community.

03 TECHNICAL SKILLS TRADE: A MODEL FOR LUNI MARBLE TRAVELLING LABOURERS

Author(s): Bozzi, Chiara (Università Ca' Foscari Venezia)

Presentation Format: Oral

The diffusion of the Luni marble between the 1st and the 2nd century in Italy and in the Western provinces is an important phenomenon in Roman stone trade, considering that its use changed the monumental panorama of cities such as Arles, Autun, Lyon, Narbonne, Nîmes, Cartagena, Córdoba and Tarraco within a few decades. Besides, the analysis of some of these contexts allowed to assume, for some time, that specialized workforce traveled with Luni marble and disseminated the urban decorative tradition in these provinces. In fact, the marble workshops that had formed in conjunction of the major imperial contracts, such as in Rome during the Augustan age, after the end of these building sites turned to other activities, including that of accompany the exported marble. Technical expertise trade is hard for us to consider, because in practice there is a lack of common and shared data collection systems.

The aim of this paper, focused on labour organization, is the creation of a model data sheet in order to identify the work of Italian travelling labourers in the Western provinces, through the examination and the recognition of stylistic and typological elements on marble products. This model would keep into account also the information coming from inscriptions or other hallmarks already studied and investigated. A standard and systematic data collection is the starting point for analyze this phenomenon and its extension. The question is trying to figure out whether this is a common situation or an isolated case of a few contexts. The model data sheet would enable the comparison between different types of information, taking more account of iconographic patterns and stylistic analysis

04 QUANTIFYING ROMAN TRANSPORT IN THE IBERIAN PENINSULA. DEFINING TERRITORIAL CONFIGURATION FROM COSTS AND TIMES OF TRANSPORT

Author(s): de Soto, Pau (Universidade Nova de Lisboa)

Presentation Format: Oral

The analysis of Roman infrastructures to understand the transport costs and the commercial routes and processes is an indispensable way to know the benefits and shortcomings of the transportation system created in Roman times. It is well known that the Roman Empire built the first big transport network. This overwhelming task included not only the construction of roads, but also the building of river ports and maritime harbours. Such a huge effort aimed to create an integrated economy covering all the Roman provinces on the Mediterranean Sea and Atlantic Ocean.

Thanks to the Mercator-e Project, it has been possible to reconstruct the Roman transport conditions by modelling travel costs and times with the help of GIS and Network Science applications. The main geographical focus of this project is the Roman Iberian Peninsula. It was necessary devote a significant effort to gather, document, analyse and digitise the Iberian Roman communications with high precision, creating the first complete road network map. The results of such applications provide us with new information to understand the distribution of commodities, product competition and problems of stagnation in ancient economies such as that of Ancient Rome.

The ability to see graphically and numeral those costs values which until now they could only be guessed, can open new perspectives and justifications to the speeches made on this field until today. In fact, the comparison between these results and the analysis of archaeological and historical interpretations should complement each other, clarifying and offering more elements for a global vision. This project allows us to discover very interesting economic patterns. The results will show how the construction of the Roman complex transport network in the Iberian Peninsula was designed with clear economical purposes.

05 AN ARCHAEOMETRIC AND EPIGRAPHIC DATABASE ON WINE ROMAN AMPHORAE FROM HISPANIA CITERIOR/TARRACONENSIS

Author(s): Martínez Ferreras, Verónica (ERAAUB, Department of History and Archaeology, University of Barcelona)

Presentation Format: Oral

Epigraphic stamps on wine amphorae from north-eastern Spain have largely been investigated but the debate about their meaning remains still open. They have been attributed to several actors associated with two main activities: 1) the production process, representing the (itinerant) potters who produced the amphorae; 2) the wine trade process, representing the owner of the packaged product, whether as a winemaker, negotiator, or exporter. Peculiarities in specific areas have recently been recognised, suggesting a chrono-spatial evolution of the sealing processes. Nevertheless, epigraphy is somewhat deficient to accurately identify the origin of the stamped amphorae, since some stamps have not been found in any pottery workshop, while others have been recovered in various (nearby or distant) production centres.

This study combines archaeological and archaeometric data on some stamped amphorae found in several pottery workshops, urban

trade centres and shipwrecks. These data have been compared with the CerUB analytical database of the ERAAUB team, which is founded on chemical (through X-ray fluorescence), mineralogical (X-ray diffraction) and petrographic (thin section optical microscopy) analyses of ca. 1400 amphorae from 28 pottery workshops, 15 consumption centres in Tarraconensis, Narbonensis and the limes, and 5 shipwrecks. The aim is to demonstrate the usefulness of a large archaeometric database to investigate provenance and trade of the sealed amphorae. Thus, it has been proved that there is no a univocal relationship between the pottery workshops in which the stamps are found, and their real provenance since the workshops also acquired amphorae produced in other centres. Since the study cases investigated are contextualised in different time periods, the research also provides significant information on the evolution of the production and trade dynamics and sealing practices developed in the region between the mid-1st century BC and the mid-1st century AD.

06 STAMPED AND INSCRIBED AMPHORAE FROM THE ANCIENT SHIPS OF PISA SAN ROSSORE

Author(s): Tescione, Teresa (University of Naples Federico II) - Pace, Gloriana (University of Pisa)

Presentation Format: Oral

The aim of this paper is to present stamps and graffiti on the amphorae found at the archeological site of Cantiere delle Navi antiche di Pisa (Italy).

During the excavation in the area of the railway station of Pisa San Rossore (1998-2014), a deposit with at least 30 shipwrecks was unearthed: this archeological deposit was associated with a watercourse, probably a tributary of the ancient river Auser (actual river Serchio). The ships, some with cargo still on board, were embedded under nine centuries of silt; after some exceptional floods due to intense rain, the Arno river broke its embankments close to a bend and poured out huge quantities of water and sediments in the area of this canal, sweeping away everything and leaving materials in the hollows of the ground. The constant erosion, renewal and movement of the stream bed has been the main catalyst for creating the deposit, but they were also formed by flood water coming from other directions.

The huge amount and variety of findings deposited in the archaeological layers is certainly due to the heavy commercial activities which characterised the area of this harbour from the Late Republican to the Late Roman time.

The research consists on a sampled series of data: stamped and inscribed (tituli picti, graffiti) amphorae found in the alluvial layers, which demonstrate the importance of the Pisa's harbours in the local Thyrrenian and Mediterranean economic sphere throughout the roman centuries.

The information processing depends on data recording in a geographical database which allowed the spatial intra-site distribution of amphorae: in this way, the documentary source could be connected to shipwreck's cargo or context of first provenance, or could be also considered as residuals or intrusives compared to the contexts in which they are placed.

07 RHODIUM VINUM IUCUNDUM. A QUANTITATIVE ANALYSIS OF IMPORTS OF RHODIAN WINE IN THYRRENIAN ITALY BETWEEN 3RD AND 1ST CENTURY BC

Author(s): Tomei, Francesca (Independent researcher)

Presentation Format: Oral

Wine has been largely produced in Rhodes and its territories in Asia Minor since IV century BC until at least II century AD. Stamped amphoras spread all over the Mediterranean and Black Sea are a marker of the diffusion and popularity of Rhodian wine, which was mainly traded with grain from Egypt, Black Sea regions and Sicily.

This paper focuses on imports of Rhodian wine in the main centers of the Thyrrenian coast of Italy during Hellenistic age. I analyzed all Rhodian amphoras well published from archaeological excavations, both on land and underwater, from Etruria to Sicily. Then I collected all information in a database, containing site of provenance, main features of the stamp (if any), such as shape, inscription and symbol, chronology and other relevant information on the amphora examined. I took in consideration also amphoras without stamp or fairly readable in order to get a better quantification of imports. Database enabled me to do statistical analysis to determine chronological trends of imports and the occurrence of particular stamps.

In addition, I linked the database to a GIS software in order to investigate spatial distribution of Rhodian amphoras. GIS let me investigate where in Thyrrenian Italy Rhodian stamped amphoras were more or less numerous, and so where this Greek wine was particularly appreciated.

08 FROM TITULI TO TRADE SYSTEM: AUTOMATED ALGORITHM FOR SYNTACTIC ANALYSIS OF EPIGRAPHICAL MATERIAL

Author(s): Romanowska, Iza (Barcelona Supercomputing Center) - Martín-Arroyo, Daniel (University of Barcelona)

Presentation Format: Oral

Imagine having 2000 inscriptions on roman amphora at your site. Each of them is unique but they do seem to follow some syntactic patterns (for example, "a name, followed by a date, followed by a number"). But how do you make any sense of them? Can these patterns be quantified? Do they group into possible 'cargos' or specific products? How are they related to the location of each amphora sherd within the city?

Here we present a Python-based software tool that compares epigraphic inscriptions to each other using the edit distance measure, calculates clusters based of this similarity and visualises them as cluster maps and dendrograms. It can also look for correlations between the defined clusters and independent variables at different thresholds.

In short, this is a tool that aids the analysis of written sources by quantifying their syntactic similarity and providing visual and statistical methods to aid the interpretation.

To showcase its functionality we applied the edit distance tool to a dataset from Pompeii comprising tituli picti found on amphoras throughout the city. The results show strong differences in the syntactic attributions between the latin and the greek worlds as well as a number of previously unknown spatial patterns.

09 MAURETANIA TINGITANA. A REVIEW OF AN ATLANTIC PROVINCE

Author(s): Pérez González, Jordi - Pons Pujol, Lluís (Universitat de Barcelona)

Presentation Format: Oral

It has already been more than a decade since Lluís Pons defended his doctoral thesis (2003), where he dealt with the economy of the province, with a particular focus on the peculiarities of the food supply of the province (imports and exports of olive oil, wine and salted fish). Ever since, both the scientific production of the province, with the inclusion of new data, as well as the progress in the different methods of analysis, allows us to approach the subject again, redefining some aspects of the economic and social history of the Mauretania.

To know the distribution of food between Mauretania and the rest of Roman provinces we have used the study of ceramic containers. In this sense, the analysis of the stamped amphorae allows us to know the provenance and the estimated date of the contained foods, basic to examine the different dynamics to which the province was subject. For current research, the distribution of stamps throughout the European space is the fundamental element that allows trade networks to be established between Baetica and other regions of the Roman Empire. We must not forget that the epigraphy of the province represents a small percentage of all the amphoric material known in the Roman Empire.

In order to carry out the following analyzes, we have used the information collected in the CEIPAC online database. In this sense, the incorporation of novel methods of analysis that allow us to approach the data from a new point of view is of interest.

10 THE MARKINGS OF THE TRADE: EXPLORING THE PATTERNS OF OLIVE OIL PRODUCTION IN ROMAN BAETICA

Author(s): Coto-Sarmiento, Maria (Barcelona Supercomputing Center) - Rubio-Campillo, Xavier (University of Edinburgh) - Remesal, José (University of Barcelona)

Presentation Format: Oral

The aim of this study is to detect the patterns of olive oil production that link amphora workshops and amphoric stamps. Roman provinces such as Baetica became important production and distribution centers during the Roman Empire. However, it remains under debate how this province was organized and whether it is possible to identify patterns in the olive oil market.

Our case of study has been focused on the production processes located in Baetica province (currently Andalusia) from 1st to 3rd AD. In particular, we want to explore economic dynamics that include the production and distribution of olive oil trade. Amphoric stamps are used to identify the presence of different producer groups that might share similar stamps. To achieve this goal, we analyse a set of stamps from different workshops in Baetica province in order to detect a relation between the distribution of amphoric stamps and the economic structure in this province. Here we use methods borrowed from Ecology that allow us to identify if these amphora workshops share similar amphoric stamps depending on the spatial distance.

The analysis explores how quantitative approach provides a useful tool for the interpretation of the economic processes. Finally, results pretend to highlight the organization of olive oil production in the Roman Empire linked to the differences observed in the archaeological evidence.

11 IDENTIFYING LONG-RANGE CONNECTIVITY WITHIN THE ROMAN EMPIRE THROUGH ARCHAEOLOGICAL PROXIES

Author(s): Rubio-Campillo, Xavier (The University of Edinburgh)

Presentation Format: Oral

The creation of the Roman Empire promoted the connectivity of a large area around the Mediterranean sea. While several works have explored the dynamics of interaction in specific case studies there is no consensus on the level of connectivity between the provinces.

The last years have seen an improvement on the availability of evidence as a growing amount of datasets is collected and published. However, the availability of new datasets also means that we need to deal with the challenges posed by this evidence, including the presence of biases and high levels of uncertainty. Moreover, data does not equal knowledge and the methods used to analyse this evidence has not advanced at the same pace.

We present here a new framework designed to identify large-scale connectivity through the use of similarity indices. The amphora

stamps collected over more than a thousand sites across the Roman Empire have been analysed using quantitative measures of similarity. The patterns that emerge from the analysis highlight the intense connectivity derived from factors such as the spatial closeness, presence of military units and the relevance of the Atlantic sea as a main shipping route. We believe that these findings will not only help understand these dynamics but the suggested approach will highlight the need for statistical hypothesis testing in the study of past economies.

a. COINS IN THE MARITIME ROMAN COLONY OF CASTRUM NOVUM. CONTRIBUTION TO UNDERSTANDING OF TRADE AND GLOBALIZATION OF THE MEDITERRANEAN SEASCAPE

Author(s): Paclíková, Klára - Vuono, Magda - Preusz, Michal (Department of Archaeology, Faculty of Arts, University of West Bohemia in Pilsen) - Enei, Flavio (Museo Civico di Santa Marinella) - Caponetto, Paolo - Fantozzi, Bruno (Gruppo archeologico del territorio Cerite)
Presentation Format: Poster

Archaeological site Castrum Novum is located right on 64.4 km of Via Aurelia, in the municipality of Santa Marinella, in central Italy. This Roman colony was founded in the third century BC at location that was the original Etruscan settlement. The reasons for and the exact period of its abandonment are so far unknown. The available archaeological evidence confirms that the settlement disappeared during the fifth century AD. The site became the object of archaeological research during the second half of the eighteenth century. Pope Pius VI financed the research of valuable artefacts that were intended to increase the collections of the Vatican Museums. Some of them have comprised a part of the collections up until now. After various stages of rescue excavations that alternated with the activities of illegal treasure hunters during the last century, systematic research returned to this site in 2010.

Long-term research brings to light hundreds of findings. The coins belong to the most important. Modern databases in combination with GIS and tools of geospatial science enable to unravel trade contacts of Castrum Novum. Concurrently, it is possible to observe how the relationships between the Romans and the surrounding populations have changed over time. Spatial analyses, related to the coins, are not only a tools for study its distribution in the research area, but especially for study of functionality of archaeological components. Moreover, they explain the process of Mediterranean seascape globalization. Collection of coins from maritime colony consist exemplars from Europe, Africa and Asia.

b. VETUSTATE CONLAPSUM. EPIGRAPHIC TESTIMONIES OF REPAIR OF ROADS AND OTHER PUBLIC INFRASTRUCTURES IN ROMAN HISPANIA (1ST - 4ST CENT. AC)

Author(s): Sánchez de la Parra Pérez, Santiago (HESPERIA Research Group. Department of Prehistory, Ancient History and Archaeology. University of Salamanca - USAL)
Presentation Format: Poster

This work approaches the study of interventions of classic era destined to the rehabilitation of Hispanic public works through the Latin epigraphy. Inscriptions gather the origin of the funding of the works, their dating, the reasons for its restoration...

The use of formulas such as *vetustate conlapsu restituit* or *renovatae a solo* allow to find out the reason and the volume of the repair. Additionally, we also compare the content of the inscription, the formal characteristics of its support and the context of its finding with the archaeological data available on the repaired infrastructures. Working with information of diverse nature requires designing a database to collect and relate it properly. Thus, we will check if the epigraphic information coincides with the archaeological remains.

There is a diversity of repaired constructions. Many inscriptions collect the intervention on roads and bridges. This type of work, financed by the imperial administration, is referenced in milestones of very different times. The development and maintenance of these infrastructures were essential in all the provinces of the Empire, since they facilitated the communication, the relations between geographically very distant cities and the terrestrial trade. Latin epigraphy also reveals the interest of local elites to repair other public works with less representation in the sample.

We can identify general guidelines in the repairs taking into account the chronology of the epigraph, its support, the type of work performed and the origin of the financing. We intend to provide information about the interest of the imperial administration in the maintenance of road infrastructures in specific areas and the significance of public works restored in the urban areas of Hispano-Roman cities.

c. THE ARCEA PROJECT

Author(s): Mateo Corredor, Daniel - Álvarez Tortosa, Juan Francisco - Santana Onrubia, Rubén - Molina Vidal, Jaime (University of Alicante)
Presentation Format: Poster

Over the last years, the scientific community has shown a great interest in the studies focused on the production and trade of Roman amphorae in ancient Hispania, as evidenced by projects such as CEIPAC, Amphorae ex Hispania or Amphora Project. However, the advances in the knowledge of Hispanic amphorae productions have been uneven, being Tarraconensis northern coast and Baetica the best identified areas. On the contrary, amphorae production of the Tarraconensis central coast is less known, despite the fact that these containers would be traded in the western empire, as shown by classic authors' references such as Juvenal and Fronto and the amphorae findings in Rome. For this reason, a research program has been started which intends to improve the knowledge

of this production and its distribution, the ARCEA project, "Production centres and trade relations in the Early Empire. Analysis of the amphorae production of the Tarraconensis central coast", funded by the University of Alicante. One of the actions developed within this project has been the analysis of the cargo of the Mariposa E shipwreck, found in Alghero coast (Sardinia, Italy). This shipwreck transported Dressel 2-4 amphorae which origin from the area of Tarraconensis central coast is proposed. Moreover, field surveys and the excavation of the production centre of La Rana (Gata de Gorgos, Alicante) have been carried out. Finally, a program of typological revision, archaeometric characterisation and epigraphical analysis of the central Tarraconensis amphorae is already initiated. First results of the project are presented.

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FROM EXCAVATION TO SEDIMENTATION: THE MULTIPROXY AND BIOMOLECULAR ENVIRONMENTAL REVOLUTION IN ARCHAEOLOGY

Theme: Theories and methods in archaeological sciences

Organisers: Brown, Antony (University of Southampton) - Gearey, Ben (University College Cork) - Koivisto, Satu (University of Helsinki) - Whitehouse, Nicola (University of Plymouth)

Format: Regular session

Research into climatic and biological proxies from marine and lake cores is now becoming useable in archaeology. These new techniques include a wide range of isotopes and biomarkers as well as sedaDNA. The potential of these techniques has grown as it has been shown that a) there is preservation of informative biomolecules well outside the cool temperate and Arctic biomes, b) the costs are reducing (slowly), c) the number of laboratories has grown, and most importantly, d) the techniques are becoming more robust (both in reliability and specificity). At present, and probably for some considerable time to come, these techniques will be used alongside traditional proxies such as pollen, diatoms and insects but they have the potential to be far more specific about both human activities (e.g. fecal sterols and bile acids) and on-site biotic conditions (species or even below species level local vegetation and plant resources). Important questions remain concerning the taphonomy of the biomolecules, spatial representation and the detection of human vs natural variation. However, the potential of waterlogged or sealed deposits, from lakes to latrines, on and adjacent to archaeological sites is huge to both answer existing and raise new archaeological questions. Contributions are invited from any studies of wetland, lake alluvial or other sites where multiple proxies and/or new biomolecular methods are being used.

ABSTRACTS

01 INDICATORS OF HUMAN IMPACT IN THE POLLEN RECORD FROM TWO EARLY MEDIEVAL CRANNOGS IN CO. FERMANAGH, NORTHERN IRELAND

Author(s): Head, Katie - Whitehouse, Nicola - Neilson, Iona (Plymouth University) - Hardenbroek, Maarten (Newcastle University) - Davies, Kimberley - Barratt, Philip (Plymouth University) - Fonville, Thierry - Brown, Antony (University of Southampton)

Presentation Format: Oral

This paper presents new pollen data from three lake sediment records at Lough Yoan in Co. Fermanagh, Northern Ireland. The records are part of a larger AHRC-funded multiproxy project, which also includes diatom and chironomid assemblages, sediment geochemistry, and sedimentary aDNA. Crannogs are lake settlements and can date from as early as the Bronze Age through to the medieval period, although the majority of sites appear to be Iron Age. Crannogs have been little investigated until now because it is difficult to excavate the submerged structures. Sediment cores taken near crannogs can bypass this problem and provide a wealth of evidence for human occupation.

Lough Yoan contains two crannog settlements within the north and south of the lake. Sediment cores have been taken adjacent to both of them as well as from the deepest part of the lake in order to determine sediment sources and inputs. The pollen record highlights evidence of human occupation on both crannogs, providing a strong signal of activity. Taxa include those of disturbed and cultivated ground, as well as cereals, with strong arable and pastoral indicators near to the crannogs. Cereals including barley (*Hordeum*-type) and rye (*Secale*), may have been stored and processed at the site, while the presence of flax (*Linum*) could suggest linen production on the lake edge. Evidence of livestock has also been found, supporting the sedimentary aDNA record in the cores.

02 STUDYING AND AUTHENTICATING SEDADNA FROM MARINE PALAEOLANDSCAPES

Author(s): Ware, Roselyn - Cribdon, Becky - Everett, Rosie (University of Warwick) - Bates, Martin (University of Wales Trinity St David) - Bates, Richard (University of St Andrews) - Fitch, Simon - Murgatroyd, Philip (University of Bradford) - Smith, David (University of Birmingham) - Gaffney, Vincent (University of Bradford) - Allaby, Robin (University of Warwick)

Presentation Format: Oral

Whilst ancient DNA studies have typically relied on valuable archaeological plant and animal macroremains, increasingly ancient sediments have been exploited as an abundant and widely available source of DNA (sedaDNA). sedaDNA has been used as a tool

to explore hominin-environment interactions, for the development of palaeoenvironmental reconstructions, and to study floral and faunal extinction events.

Here we will use the work we are currently undertaking on sediment cores from Doggerland to discuss not only the limitations and challenges involved when working with sedaDNA, but also the power and relative merits of the approaches we can use. We will also demonstrate the benefits of using a variety of complimentary methods, in addition to sedaDNA approaches. These should be used in order to guide study design and, crucially, in the contextualisation and validation of findings.

sedaDNA analysis can be confounded by contamination from modern DNA sources, which can arise from leaching between the sediment strata, or during sampling and processing. Characteristic DNA breakdown patterns, including cytosine deamination, are used to authenticate the age of the ancient DNA. However, the extent of deamination expected under various environmental conditions is currently limited by a narrow training set of sample types that are unrepresentative of marine environments. We have demonstrated that, *in vitro*, rates of cytosine deamination are significantly reduced for free DNA in saline environments; a result has implications for the use of DNA damage patterns as a tool for the authentication of ancient DNA where samples are derived from a marine context.

The exploitation of sedaDNA has tremendous scope not just for expanding our understanding of human-environment interactions as in this study, but as a tool that can, potentially, be applied worldwide.

03 USING SEDADNA ALONGSIDE PALAEOENVIRONMENTAL PROXIES FOR UNDERSTANDING WETLAND AND LAKESIDE ARCHAEOLOGICAL SITES

Author(s): Brown, Antony (University of Southampton) - Hardenbroek, Maarten (School of Geography, Politics and Sociology, University of Newcastle) - Fonville, Thierry - Langdon, Peter (University of Southampton)

Presentation Format: Oral

Wetland sites, including settlements on lake shores and artificial islands, often provide a wealth of well-preserved archaeological material, but are generally difficult and expensive to excavate conventionally. An alternative, or complimentary approach, can be the retrieval archaeological data from lake sediments, which can under certain conditions contain a continuous record of the archaeological site, the lake and its surrounding catchment.

Here we present early data from a study of three crannogs (artificial island settlement) and an Iron Age lakeshore village in Scotland where sedaDNA data was analysed from proximal sediment cores. The sedaDNA provides detailed information about the plants and mammals that lived, died, or were kept on the sites in different periods of site use. This information is compared with a range of traditional palaeolimnological proxies that allow us to differentiate between (i) changes that happened regionally in the lake catchment (based on pollen, x-ray fluorescence scanning, stable carbon and nitrogen isotopes, n-alkanes), (ii) changes that happened in the lake ecosystem (based on loss-on-ignition, diatoms, biogenic silica, invertebrates, C:N ratios), and (iii) changes that occurred very locally at the sites (based on pollen and spores, invertebrates, sterols, PAHs, and sedaDNA).

Our sedaDNA results complement data from both archaeological excavation and traditional palaeoenvironmental proxies to provide a more detailed and robust image of the environment in which our ancestors were operating. We also show that different proxies in the same sediment core provide insights in past environments at different spatial scales.

04 HUMAN-ENVIRONMENT INTERACTIONS IN THE ALPS: INTEGRATING MULTIPLE SCALES OF ANALYSIS VIA ARCHAEOLOGICAL AND PALAEOENVIRONMENTAL EVIDENCE: THE SIGNIFICANT POTENTIAL OF SEDADNA

Author(s): Walsh, Kevin (Department of Archaeology, University of York) - Giguët-Covex, Charline (EDYTEM, UMR 5204 CNRS, Université de Savoie) - Bajard, Manon - Develle, Anne-Lise - Poulénard, Jérôme - Sabatier, Pierre - Arnaud, Fabien (MR 5204 CNRS, Université de Savoie) - Ficetola, Francesco - Gielly, Ludovic - Wentao, Chen (Laboratoire d'Ecologie Alpine, CNRS UMR 5553, Université Joseph Fourier)

Presentation Format: Oral

One of the issues facing archaeologists and palaeoenvironmental scientists working in (sub)Alpine zones (between c. 1600 and 2800 m asl) is the spatially disparate nature of our various datasets. In addition, human-environment interactions operate at many spatial and temporal scales, and the integration of these data in this complex spatio-temporal framework, is often problematic. Here, we will consider the manner in which data categories and associated inferences operate at different spatial scales; first, we will briefly consider climate and broader scale change at continental and regional scales. We will then focus on local scales (e.g. individual valleys or parts thereof). We will do this via examples from our research in the French Alps where broad-scale climatic determinism has been fashionable for some time. We will consider the categories of archaeological and palaeoenvironmental evidence that inform our interpretations of settlement patterns and broader changes in the exploitation of high altitude areas. This scale includes the integration of palynological and sedimentological evidence that represent environmental changes and allows us to infer certain economic activities, such as pastoralism and mining. Our contribution will then focus on the potential of aDNA (when combined with other evidence - archaeological and palaeoenvironmental) to infer localised activities and practices. We emphasise the importance of this final scale, especially *vis a vis* the use of aDNA. The development of "archaeogenetics", whereby the study of aDNA informs our understanding of human-environment dynamics during the past is a "game-changer" in alpine archaeology, particularly pertinent from our perspective is our ability to now identify the movement of new animal species into a landscape and the consequences of

this process on the environment. Part of this contribution will consider the importance of understanding taphonomic processes that affect the transport and deposition of aDNA.

05 INVESTIGATING THE NATURE AND TIMING OF THE EARLIEST HUMAN OCCUPATION OF NORTH AMERICA USING A LIPID BIOMARKER APPROACH

Author(s): Whelton, Helen (University of Bristol) - Shillito, Lisa-Maris (Newcastle University) - Bull, Ian (University of Bristol)

Presentation Format: Oral

The question of how, when and why people first settled the Americas has been a subject of intense debate which continues to the present. There are two schools of thought, the 'Clovis First' and 'Pre-Clovis' theories, with the former asserting that the Clovis culture was the earliest human presence in North America arriving ca.13,500 cal BP. Evidence of 'Pre-Clovis' human occupation in North America obtained through DNA analysis of coprolites from the Paisley Caves, south-central Oregon, has dated the earliest occupation to 14,300 B.P., one thousand years earlier than previous evidence suggests. Coprolites (fossil faeces) contain a suite of lipid biomolecules and are an invaluable source of palaeobiological and palaeoecological information. The identification of faecal matter through the presence of highly-specific lipid biomarkers ($\delta\beta$ -stanols and bile acids) has been used to identify and characterise faecal input from a range of different sources. Differentiation of these faecal markers is enabled through the diet, digestion and metabolism of the source animal. Lipid analysis of coprolites has also been used to identify dietary biomarkers, providing information regarding available plant resources. Here, a lipid biomarker approach will be applied to sediment and coprolite samples from the Paisley Caves with the aim of identifying the timing of the earliest occupation of North America by characterising the origin of coprolites found in well-stratified archaeological deposits. Biomarker analysis will also be applied to investigate diet which will enhance our understanding of the relationship between early humans and their environment.

06 WHAT HAPPENED TO MY aDNA? PRE-, SYN- AND POSTDEPOSITIONAL TAPHONOMIC PROCESSES THAT AFFECT OUR SEDIMENT RECORD

Author(s): Bleicher, Niels (Underwaterarchaeology / DendroLab City Of Zürich)

Presentation Format: Oral

A piece of copper in a bronze age deposit is a find. A piece of copper in an early neolithic deposit is a sensation – provided it belongs there. The context is the key to transform measurements and data into stories. A deeper understanding of the complicated taphonomic processes is therefore prerequisite for a sound interpretation of data from any given sediment sequence. In this talk a number of processes in shallow water contexts are discussed that affect layer genesis. Among these are: erosion and redeposition, oxygen depletion, the numerical effects of changes in sedimentation rate, discontinuous, heterogenous and inhomogenous deposition as well as lateral movement. Each is given alongside well documented surprising examples of depositional sequences and their explanations. The examples are taken from archaeological excavations of Swiss and German lakeside settlements, where multi-disciplinary research was successful in reconstructing the taphonomy. These settlements were at least partly situated in shallow water and subject to all the processes mentioned above. Especially the recently published site of Zurich-Parkhaus Opéra gave the opportunity to study depositional processes in detail. This was done in cooperation with geotechnics, paleoecology, archaeobotany, micromorphology and archaeology. The stratigraphy comprised archaeological deposits both with and without waterlogged preservation that had been deposited within only few decades. One of the more surprising results was that deposits can even affect the preservation in other deposits.

07 ADVANCING OUR UNDERSTANDING OF PREHISTORIC LAKE SETTLEMENTS: EXTRACTING DIRECT EVIDENCE OF HUMAN OCCUPATION USING LIPID BIOMARKERS

Author(s): Mackay, Helen - Henderson, Andrew - Hardenbroek, Maarten (Newcastle University) - Davies, Kimberley (Plymouth University) - Fonville, Thierry - Langdon, Peter (University of Southampton) - Whitehouse, Nicola (Plymouth University) - Cavers, Graeme - Crone, Anne (AOC Archaeology Group) - Brown, Tony (University of Southampton)

Presentation Format: Oral

Crannogs are artificial islands constructed in lakes and wetlands across Scotland and Ireland from the Iron Age to the Medieval period. Excavations of partially or fully submerged crannog structures can be logistically and financially challenging, therefore the timing of crannog occupation and function remains poorly constrained. Analysis of sedimentary archives adjacent to crannog structures have been used as an alternative approach to excavation, however, currently applied analyses can only provide indirect evidence of human occupancy. Our research provides direct anthropogenic evidence using steroid biomarkers contained within wetland sediments. These compounds provide evidence of human and animal faecal matter in a range of depositional contexts, but their application to wetland archaeology has been limited.

Steroid analysis was undertaken on sediment record archives proximal to two neighbouring Iron Age wetland settlements in south-west Scotland: Black Loch of Myrton and White Loch of Myrton. Evidence of human faecal matter was identified at both sites, demonstrating preservation of faecal steroids within wetland sedimentary environments. The ability of these steroids to provide direct evidence of human occupation is supported by occupation dates independently obtained from archaeological excavations. Steroid ratios indicate the presence of ruminants within the settlements, which is confirmed by sedimentary DNA (sedaDNA) analyses and supported by palaeoecological reconstructions of faecal matter (fly puparia and beetles) and nutrient-driven changes in

aquatic ecology (diatoms and chironomids). The similarities between faecal steroid records and independent lines of chronological and palaeoenvironmental evidence highlights the ability of lipid biomarkers to provide direct evidence of human occupation from wetland sediments, but also demonstrates the ways in which these analyses can be used to characterise occupation phases and advance interpretations of wetland archaeological sites.

08 AQUATIC ECOSYSTEM RESPONSE TO LATE HOLOCENE HUMAN DISTURBANCE: MULTIPROXY EVIDENCE OF HUMAN INFLUENCED VARIATION IN SMALL LAKES

Author(s): Davies, Kimberley (Plymouth University) - Fonville, Thierry (University of Southampton) - Mackay, Helen (Newcastle University) - Head, Katie - Whitehouse, Nicola - Barratt, Phil (Plymouth University) - Langdon, Peter (University of Southampton) - Hardenbroek, Maarten - Henderson, Andrew (Newcastle University) - Brown, Antony (University of Southampton)

Presentation Format: Oral

Humans have always been attracted to lakes as resource hotspots. In the Iron Age to Medieval Period in Ireland and Scotland, this attraction culminated in the construction of artificial islands called crannogs, in thousands of small and largely lowland lakes. The particular characteristic of this human-lake interaction was small but very actively used settlements within small and lakes that were typically sensitive to environmental change. Although we have only some ideas concerning why these crannogs were originally constructed, we can detect activities with both high-temporal and high analytical resolution which appear to have had profound effects on and within the lake environments.

Our research on crannogs characterises the prehistoric human-environment interactions associated with crannogs by analysing geochemical and biological signals preserved within both the crannog and wetland/lake sediments. Records of anthropogenic activities have been produced using lipid biomarkers of faecal matter, sedimentary DNA (sedaDNA) and beetles. The impacts of these activities are revealed through palaeoecological proxies such as aquatic invertebrates (chironomids), siliceous algae (diatoms), pollen and fungal spores. Results of these analyses reveal short-lived construction and occupation phases from the Iron Age to the Medieval Period. The main effects of human activities that are related to both plants and animals, on the lake ecosystems are nutrient-driven increases in productivity and shifts in aquatic species to indicate more eutrophic conditions. Crannog abandonment reduces nutrient inputs and therefore levels of aquatic productivity, as evidenced by decreases in the abundance of siliceous algae. Despite returns to pre-settlement nutrient and productivity levels, the lake ecosystems do not return to their previous ecological state. Testing and quantifying the resilience of these ecosystems is key to understanding the impact of these short-lived human interactions and to assessing any persisting environmental impacts that have shaped the long-term structure of the aquatic ecosystems.

09 EXPLORING NEOLITHIC IN SOUTH-EASTERN FINLAND THROUGH HIGH RESOLUTION MULTI-PROXY ANALYSES FROM LAKE SEDIMENT ARCHIVES

Author(s): Alenius, Teija (University of Helsinki) - Heino, Matti (University of Helsinki; University of Oulu, Department of Genetics & Physiology)

Presentation Format: Oral

Two parallel sets of cores were retrieved from sediments from a small bay in eastern Finland in order to gain information on Neolithic land use and human activity during the Neolithic Stone Age, 5200–1800 BC. Archaeological finds indicate only modest Stone Age habitation. Most of the sites could not be dated more accurately than to the Stone Age or to the subsequent Early Metal Period (in the inland areas of Finland, this is dated to 1800 BC - AD 300).

We used pollen and charcoal analyses in order to find out on the Neolithic land use and environment and measurements of loss on ignition (LOI), magnetic susceptibility and geochemical analyses to describe the sedimentological characteristics. Palaeomagnetic dating were supported by ¹⁴C-datings. DNA metabarcoding approach was used on lake sediment archives to provide reliable and novel information regarding human occupation. We also present a pollen-inferred quantitative reconstruction of past vegetation cover on a regional spatial scale using the REVEALS model and on local spatial scales using the LOVE model (Sugita 2007 a,b).

The analyses revealed human activity between 4400 and 3200 BC, which is synchronous with archaeological cultures defined through different stages of Comb Ware pottery types and Middle Neolithic pottery types with asbestos as a primary temper. The climate has been optimal for cultivation as the period coincidences with Holocene Thermal Maximum (HTM), which bore a trend toward a more “continental” climate, with maximum midsummer temperatures being reached between 4550 and 2550 B.C. (Ojala et al., 2008). According to the pollen-based landscape reconstructions landscape remained forested and more significant effort was put into the production of fibres from hemp and lime than the actual cultivation of food.

10 PALAEOENVIRONMENTAL PROXIES FROM A PALAEOCHANNEL SEDIMENTS ADJACENT TO A LONG-LIVED MESOLITHIC SITE IN THE ENVIRONS OF STONEHENGE WORLD HERITAGE SITE

Author(s): Brown, Antony (PLUS, University of Southampton) - Pears, Ben (University of Southampton) - Jacques, David (University of Buckingham) - Young, Dan (QUEST, University of Reading) - Fonville, Thierry (PLUS, University of Southampton)

Presentation Format: Oral

The site of Blick Mead is located on the fringes of the Stonehenge World Heritage site at Amesbury, UK. It is a long-lived Mesolithic

site with on-site activity over approximately 4000 years. Excavations have taken place since 2014 of a low terrace preserved under a Medieval lynchet and into a palaeochannel orientated adjacent to the channel. In geomorphological terms the site is located on a low eroded terrace remnant adjacent to a series of superimposed palaeochannels on the north side of the current floodplain of the River Avon. A series of boreholes across the site at two spatial scales reveal intra-site stratigraphy and show distinctive episodes of flooding into abandoned channels. The archaeological excavations have demonstrated an extraordinary level of preservation of features, deposits and artefacts including a buried landsurface, stone surface, macrofaunal animal tracks and phenomenal number of lithics, alongside bones of wild animals and fish.

Palaeoenvironmental and geoarchaeological investigations are on-going and include pollen and spore analysis, which has revealed that the site existed in a distinct gap in the unusually species rich broad-leafed forest alongside spore evidence indicating the presence and possible grazing of large herbivores. Sediment aDNA, Loss on Ignition, magnetic susceptibility and particle size analysis is also being undertaken from what are waterlogged but highly clastic rich organic sediments corresponding to site occupation. Additional monolith sampling of the excavated archaeological horizons will allow detailed physical and elemental analysis of the buried landsurface and Mesolithic stone surface to be conducted using micromorphology and XRF (ITRAX) analysis. The use of multiproxy analysis on this site of national importance will reveal in greater detail the relationship between humans, animals and the landscape, as well as dramatically increase our understanding of the occupation, inhabitation and use of channel-edge locations during the Prehistoric period.

11 ROOTS OF MODERN DIET IN FRENCH ALPINE FOOTHILLS: A PROGRESSIVE HISTORY REVEALED BY LAKE SEDIMENT DNA AND POLLEN

Author(s): Giguet-Covex, Charline - Messenger, Erwan - Doyen, Elise (EDYTEM, CNRS, Université Savoie Mt Blanc) - Etienne, David (CARTEEL, INRA, Université Savoie Mt Blanc) - Malet, Emmanuel - Fanget, Bernard - Poulenard, Jérôme - Arnaud, Fabien (EDYTEM, CNRS, Université Savoie Mt Blanc)

Presentation Format: Oral

The Alps have a long story of exploitation of the Nature, especially for agricultural and thus feeding purposes. Alpine people developed a system of agricultural activities taking advantage of the altitudinal gradient, in particular for pastoral activities. At low altitude around peri-alpine lakes, they developed lake villages since the Neolithic. Subaquatic archaeological researches evidenced crops and livestock farming activities close to these villages. Moreover, a specific molecular biomarker detected in lake sediments of the french lakes Le Bourget and Paladru highlighted millet cultivation during the Bronze Age.

In this new study we propose to rediscover the story of exploitation/management of alpine foothills lands by peasants. In this aim, we crossed pollen analyses and coprophilous fungi with an emerging and promising tool, the lake sediment DNA. These techniques were applied on Lake Aiguebelette sediments covering the last 2000 years, to have the most comprehensive view of the diet. The high-resolution reconstruction suggests a decline of agricultural activities at the end of the Roman Empire. From 500 AD, pollen and DNA analyses evidence the cultivation of diverse fruit trees and the presence of pastures. DNA analyses provide more details on the nature of activities. Between 800 and 1000 AD, all activities decline. Two phases of growth of agro-pastoral activities (with fruit trees, hemp, hop, buckwheat, beans, peas and pastures) are then recorded between 1000 and 1400 AD and 1500 and 1850 AD. The last century is characterised by the development of vegetable gardens, as we know them today, with for instance celery, green beans, beetroots or cardoons.

a. USING SEDADNA FROM NORTH SEA SEDIMENT CORES TO RECONSTRUCT THE EARLY HOLOCENE PALAEOENVIRONMENT

Author(s): Cribdon, Becky - Ware, Rosie - Everett, Rosie - Allaby, Robin (University of Warwick)

Presentation Format: Poster

Until around 7000-8000 years ago, much of the southern North Sea was a coastal plain now named Doggerland. Evidence from surrounding countries and occasional artefact finds suggest that Doggerland was inhabited, and it is expected to be a rich source of archaeological information. However, the seabed does not facilitate typical archaeological excavation. This study aims to reconstruct the early Holocene landscape using the palaeoenvironmental proxy of sedimentary ancient DNA (sedaDNA) from seabed cores.

Previous studies have found sedaDNA to be complementary to the traditional proxies of pollen, microfossils and macrofossils. Marine sediment is available in large quantities, so is suitable for destructive sampling, and should facilitate good DNA preservation through constant low temperatures and high ionic strength. Preliminary results from Doggerland and a pilot study at Bouldnor Cliff demonstrate the utility of sedaDNA in this context.

We will use next-generation sequencing to generate a list of taxa present in each sediment sample. These will be combined with dates, mapping and traditional palaeoenvironmental proxy data from other teams to reconstruct the landscape through time. We will track the transition from coastal plain to inundation by the sea, and search for evidence of Mesolithic activity as well as proxies of Neolithisation. The timing of Neolithisation in northwest Europe is still uncertain; it may have been in progress before inundation was complete. New information from Doggerland could help to fill this gap.

b. SUBMERGED COASTAL PALAEOLANDSCAPES AND THE IMPACT OF INTER-TIDAL ENVIRONMENTAL VARIABILITY: ASSESSING ANCIENT DNA PRESERVATION AT BORTH BEACH (CARDIGAN BAY, WALES)

Author(s): Everett, Rosie - Ware, Roselyn - Cribdon, Becky (University of Warwick) - Bates, Martin (University of Lampeter) - Allaby, Robin (University of Warwick)

Presentation Format: Poster

The application of sedimentary DNA (sedaDNA) analysis for palaeoenvironmental reconstruction has already demonstrated successful extraction and metagenomic sequencing from deep-sea sediment. Analysis of the preservation of this ancient DNA has suggested that the stable cool saline conditions of marine environments provides suitable conditions for reduced processes of DNA degradation, therefore providing an additional proxy for local-scale palaeoenvironmental reconstruction and identifying palaeoecological diversity.

In contrast, little research has been undertaken to understand how this rate of degradation is reflected within sedaDNA extracted from coastal environments. In particular, the field is lacking an understanding on the impact of the environmental instability within intertidal zones on sedaDNA deposition and degradation, where changing tides and processes of erosion do not provide the same environmental stability as deep-sea environments.

Using boreholes extracted from the intertidal zone at Borth beach, this project aims to sequence sedaDNA from areas of intertidal deposits, in order to assess the extent in which changing saline conditions through tidal cycles, impacts on processes of DNA degradation. The analysis will also examine how contamination through natural erosion and inundation has impacted the integrity of the cores and possible deposited archaeological material. The known depositional history at Borth beach will provide a robust environment to test the understanding of sedaDNA preservation, as the recorded stratigraphy not only demonstrates the variability in deposits (peat, clay, areas of submerged woodland), but also provided a temporal framework for the analysis.

SedaDNA is a relatively novel field of palaeoenvironmental research, and as with more traditional proxies, requires a better understanding of key analytical issues such as taphonomy and environmental constraints. The changing salinity and processes of erosion expected within this intertidal zone at Borth beach, provides an opportunistic environment for answering some of these questions around the process of deposition and preservation of sedaDNA within coastal environments.

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TECHNOLOGY AND ARCHAEOBOTANY OF PLANT-BASED CRAFTS

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Martin Seijo, Maria (Universidade de Santiago de Compostela) - Deforce, Koen (Royal Belgium Institute of Natural Sciences; Flemish Heritage Institute) - Bellavia, Valentina (Bureau d'études archéologiques Eveha; Université Clermont Auvergne) - Andonova, Mila (University of Nottingham; Bulgarian Academy of Sciences)

Format: Regular session

This session focuses on the study of wild plant resources employed as raw material in crafts (basketry, cordage, wrappings, clothing, containers, handles, shafts, combs etc.). Wood, fibers, bark, stems, roots, leaves or needles have been used for crafting utilitarian and ritual objects. Nevertheless their role in the day-to-day life of past communities is underrepresented, because of their scarce preservation or their insufficient study. However, the growing research field of plant-based crafts provides extensive insights on the selection and use of plant material and the required technological knowledge of past societies. The session welcomes all contributors dealing with technological and archaeobotanical analyses of craft objects, and especially those presenting combined approaches.

This session is organised in conjunction with the PlantWild Community of EAA.

ABSTRACTS

01 PLANT CARPET FROM MESOLITHIC FINLAND?

Author(s): Vajanto, Krista (Nanomicroscopy Center Aalto University) - Salo, Eveliina - Huttunen, Majja (Nordic Maritime Group Oy)

Presentation Format: Oral

Plant material items from the Stone Age are very scant in the Finnish archaeological record. Acidic soil does not usually preserve organic material. Surviving objects are typically from bog context and wooden. Unexpectedly, in summer 2017, another kind of plant material item was discovered in underwater survey around a possible Stone Age settlement at lake Puruvesi, in Eastern Finland.

This find was found in a core sample from the lake bottom 4.5 meters below the present water level. Interesting plant material situated in a peat layer formed on a shallow water long time ago. Radiocarbon dating results of the layer will be available soon. However, the depth of this peat layer suggests that it dates back to the local Mesolithic period, i.e. a layer that was formed ca. 10 000 years ago.

The plant material object seemed to be made with a simple basketry technique. Only parallel find for using tree bark material during that period is the famous fishing net of Antrea, made of plied willow bark strings, found only 80 km distance from Puruvesi site.

Small samples from the wet item were dried with liquid nitrogen and a freeze dryer. After that, the samples were observed with optical and scanning electron microscopy. Modern plant samples were used as a reference material.

As a result, two kind of plant materials were found. Presumably, there were bundles some kind of stiff hey (*Poaceae*) used as warps, and straps of linden bark (*Tilia cordata*) used for tying the hey material.

The item is unique in Finland and difficult to interpret. Are we dealing with some kind of Stone Age carpet or mattress? Something to cover or wrap? Something connected to fishing or to settlement activity? Or, could nature produce this kind of structures?

02 IN SEARCH FOR PREHISTORIC BASKETS: MAT/BASKETRY IMPRESSIONS ON POTTERY FROM NEOLITHIC BULGARIA AND GREECE

Author(s): Andonova, Mila (Department of Classics and Archaeology, University of Nottingham; Division of Palaeobotany and Palynology, Bulgarian Academy of Sciences)

Presentation Format: Oral

Mat/basketry impressed pottery is relatively common within the Neolithic ceramic assemblages of the Balkans. This presentation focuses on examples from diverse Neolithic sites of Bulgaria and Greece, viewed through a botanical perspective, where the plant material, chosen for weaving mats or basketry objects, which left their impressions on the pottery fragments, will be examined. The lack of diagnostic plant morphology within the impressions shapes the study of this type of archaeological material, which is ultimately very challenging.

Here several combined approaches towards the botanical identification will be presented, including microscopic techniques, secondary impression analysis, digital imaging and experimental procedures. The technological aspects of the weaving techniques employed in the original basketry object will be brought into the context of the physical parameters of the ceramic vessels, such as size, diameter and weight. The botanical aspects of the impressions were subject to multiple analyses, including light and SEM microscopy, combined with imaging strategies and supported by experimental impressions originating from Herbarium specimens.

This multi-proxy approach to mat/basketry impressions on pottery aims to propose a set of techniques towards the botanical identification of prehistoric material from Bulgaria and Greece, with the potential also to be applied and also to different time periods and geographical regions.

03 THE WOODWORK, WICKER AND CORK ASSEMBLAGE FROM THE ROMAN HEALING SPA OF CHAVES, PORTUGAL

Author(s): Carneiro, Sérgio (Município de Chaves; UNIARCH - Universidade de Lisboa)

Presentation Format: Oral

The excavation of this important site in the northwest of the Iberian Peninsula, produced a large number of waterlogged wooden artifacts, namely combs, handles, beads and spindle whorls, bowls and an ampulla, toys and other objects of a more elusive functional interpretation. A few wicker fragments were also found, one of them belonging to a bottle liner with cork insulation. Some cork stoppers also comprise the assemblage.

Some of these artifacts were found in the conduits of the spa complex, and can therefore be considered as rejects, trash, or lost items; while others come from the pools, and were probably in use in the moment when the complex was sealed by the collapse of the barrel vault, dated by the pottery and coins to the last decade of the fourth century AD or the first years of the fifth. In pool A there were also the skeletons of three individuals and numerous coins, ornaments and glass fragments. All of this assemblage's deposition date, however, can be narrowed down considerably, by the perishable quality of these materials before they were preserved by waterlogging.

This paper presents the typological and functional study of these artifacts, as well as the relation between the wooden vessels and pottery types from late antiquity and a discussion of their place in a healing spa.

04 WOOD TAR PRODUCTION IN EUROPE FROM ANTIQUITY TO 18TH CENTURY: TECHNIQUES AND KNOWLEDGE

Author(s): Burri, Sylvain (TRACES UMR 5608 UT2J-CNRS)

Presentation Format: Oral

Wood tars are neoformed resinous products extracted by pyrolysis from wood or bark (cf. birch), as opposed to mineral tars. In Europe, they were extracted from various plant families depending on time periods and bio-geographical zones: Pinaceae (*Pinus* sp., *Cedrus* sp., *Larix* sp., *Abies* sp.), Cupressaceae (*Juniperus* sp.), in conifers and Betulaceae in deciduous trees. The basic technical principle of extraction is to exude from the raw material (softwood or birch bark), by subjecting it to a heat treatment (direct or indirect), an exudate, which is then transformed into tar. This principle, called "distillatio per descensum" by medieval scholars. While the basic principle is simple, reading scholarly treatises, and even more so archaeological data, reveals the broad diversity of its implementation across time and space. They have been used for their adhesive, water-repellent, insect repellent and medicinal properties.

Archaeologists became interested in these forest products more recently, but in a very irregular manner, depending on country. Also,

the attention paid to vegetable tars in Central and Eastern Europe is disproportionate to that of southern Europe, where research projects are fewer and more widely scattered. On the other hand, the historians seem to show an almost total lack of interest. With the proliferation of data related to the growth of environmental archaeology and the archaeo-sciences on the one hand, and of preventive archaeology in rural areas on the other, it now seems necessary to collate and compare such data. This paper is thus intended to summarise, on a European scale and from ancient times to the 18th century, by bringing together archaeological and historical data. This approach aims to raise questions that are barely perceptible at a microscopic (geographical and/or chronological) or strictly disciplinary level.

05 WOOD USE IN EARLY MEDIEVAL WEAPON PRODUCTION

Author(s): Deforce, Koen (Royal Belgian Institute of Natural Sciences; Flemish Heritage Agency) - Haneca, Kristof (Flemish Heritage Agency)

Presentation Format: Oral

Early medieval inhumation graves of male adults in NW-Europe often contain a specific set of weapons (long and short sword, shield, spear, axe, bow and arrows). Apart for the bow, all these weapons consist of both wooden and iron components (e.g. iron sword with wooden scabbard, iron axe with wooden handle, iron shield boss on wooden shield, wooden shaft for iron spear and arrow head). The wooden parts of these weapons have, in most cases, rotten away in the soil but of ten, small wooden fragments are preserved in the corrosion layer of the metal components of these objects.

In this paper, the analyses of mineralized wood remains from a large number of weapons excavated at Merovingian (5th – 8th century AD) cemeteries in Belgium are presented. These results are compared with a large dataset of more than 850 wood identifications from similar early medieval weapons from neighboring countries (The Netherlands, Germany, France and England) to detect similarities and differences in the use of specific wood taxa for the production of different types of weapons, between different regions in NW-Europe. The results show that the selection of wood taxa for specific weapons was largely similar all over NW-Europe during this period, e.g. common ash (*Fraxinus excelsior*) being the preferred wood for arrow and spear shafts, alder (*Alnus* sp.) for scabbards and willow/poplar (*Salix/Populus*) for shields. However, some regional differences emerged from this extensive dataset, e.g. the use of holly (*Ilex aquifolium*) for the production of axe handles being restricted to N-Belgium.

06 USAGE OF TREE BAST IN THE BALTIC SEA REGION ON THE BASIS OF 14TH CENTURY COG FINDS

Author(s): Rammo, Riina (University of Tartu)

Presentation Format: Oral

Remains of a relatively well preserved cog from the beginning of the 14th century were unearthed during rescue excavations at a building site in Tallinn Kadriorg (Estonia). Due to favourable preservation conditions, items and remains of organic origin were found inside the ship. Among other things, ca. 150 archaeological units of mats, ropes and other items made of plant fibres were listed. The fibre identification based on various microscopy techniques (optical, polarized light, scanning electron microscopy) were carried out. In addition to flax (*Linum usitatissimum*) and hemp (*Cannabis sativa*) relatively numerous artefacts made of tree bast and some items made of tree bark (e.g. *Betula* sp) were distinguished.

The presentation gives an overview about usage of tree bast fibres and bark for the utilitarian objects on a medieval cog in the 14th century. Mostly the bast from lime tree (*Tilia* sp) was used. The majority of the objects made of tree bast are ropes and mats, but one bast shoe was discovered as well. It seems that tree bast was used for special purposes (e.g. certain ropes, mats) and probably the choice of raw material was related with particular qualities of the fibres. Some methodological difficulties regarding the identification of tree bast fibres are pointed out.

07 CHAÎNES-OPÉRATOIRES AND BIOGRAPHICAL APPROACHES TO THE STUDY OF PLANT-BASED CRAFTS FROM MEDIEVAL CONTEXTS OF NORTH-WESTERN IBERIA

Author(s): Martin Seijo, Maria (Universidade de Santiago de Compostela)

Presentation Format: Oral

A growing and heterogeneous assemblage of plant-based crafts –which includes mostly containers but also other kind of objects – has been recovered from archaeological contexts dated to the Middle-Ages in North-western Iberia. These artefacts have been recovered from urban and rural contexts, most of them preserved by waterlogging inside pits or ditches, although occasionally several pieces have been preserved by mineralisation –when plant remains were in direct contact with metal remains- or by carbonisation. Their exceptional state of preservation favoured an exhaustive study and analysis, which includes not only archaeobotanical or technological analysis. Their analysis was enlarged with the concepts of chaîne-opératoire and object biography. The chaîne-opératoire could be defined as the sequence of actions involved in the production processes of plant-based crafts, emphasizing each stage of crafting, from raw material procurement to the final product. This concept enlarges our archaeobotanical and technological approach because the study is not only focused on the study of the archaeobotanical remains but also on the sequence of actions, gestures and techniques involved in their production. Finally, human-object relation is approached through the concept of artefact biography widening our knowledge of an object by including post-production stages such as their use, consumption, recycling or discarding.

a. WOOD SELECTION AND TECHNOLOGY FOR ROMAN AGE WEAVED BASKETS PRODUCTION IN GALLIA BELGICA

Author(s): Deforce, Koen (Royal Belgian Institute of Natural Sciences; Flemish Heritage Agency) - Haneca, Kristof (Flemish Heritage Agency)

Presentation Format: Poster

Recently, several Roman age weaved baskets have been excavated in Northern Belgium. All of these baskets were found at the bottom of wells. Some were (re)used as lining for the bottom part of the well construction while others were deposited in the well after construction. For the first time in Belgium, technological aspects and wood selection for the construction of these baskets have been studied in detail.

The wood taxa used for the different parts of the baskets have been identified, and have been supplemented with measurements of the diameter of the twigs, the number of growth rings observed on their cross-section, the determination of the felling season based on wood-anatomical features, etc. Both the technology and the selection of the materials used shows a high degree of homogeneity between the studied baskets and indicates an advanced knowledge of the technical characteristics of the used materials by the artisans that have made these objects. Most of the twigs used for the wicker-work were harvested at an age of 1-2 years from willow shrubs or coppice. The twigs were cut during fall or winter. For the vertical elements, thin slats of *Fraxinus excelsior* or *Quercus* wood were used. Wood use and technology of these baskets from Northern Belgium is compared with Roman age baskets from other regions and with medieval baskets.

b. A COMPARATIVE STUDY OF CRAFT TRADITIONS IN THE BATANES ISLANDS, THE PHILIPPINES AND LANYU ISLAND, TAIWAN

Author(s): Kerfant, Celine (University Rovira i Virgili)

Presentation Format: Poster

This ethnobotanical study aims at providing a better knowledge of basketry traditions and plant-based raw materials that were used for this craft in Southeast Asia. Taiwan and the Philippines correspond to tropical and subtropical areas. Batanes, Northern Philippines, and Lanyu, Southern Taiwan, are located on the northern boulder of Neo-Wallace line. These are isolated contexts by deep sea since the Last Glacial Maximum and host numerous vegetal taxa, most of which are endemic and can be used as markers of contact. Handicraft is mostly made out of vegetal fibres of specific properties, such as limited length, flexibility, imputrescibility, among others. These fibres are usually prepared through the use of different techniques and are made into containers, nets, ropes, garments, and others, with every kind of production representing a unique knowledge. Creating a reference collection of Ivatan (Batanes Islands) and Yami-Tao (Lanyu Island) present-day handicraft will be useful in identifying and comparing plants and the techniques used for manufacturing ancient handicrafts. This research also includes the creation of a bio-cultural database aiming to recording plants properties, distribution and propagation aspects and anatomical signature as well. Hence to provide useful data for further researches on plant use through times. Moreover this type of analysis can be applied to archaeological artefacts where botanical microremains such as anatomical parts, starch grains and phytoliths may have been preserved.

495 METHODOLOGICAL ADVANCES IN COASTAL AND MARITIME ARCHAEOLOGY

Theme: Theories and methods in archaeological sciences

Organisers: Hausmann, Niklas (Institute of Electronic Structure and Laser, Heraklion; Department of Archaeology, University of York; Department of Archaeology, MPI-SHH) - Colonese, André (Department of Archaeology, University of York) - Bailey, Geoff (Department of Archaeology, University of York)

Format: Regular session

Coastal and maritime archaeology has undergone unprecedented methodological advances in the last decades, from sophisticated remote sensing and submerged landscape reconstructions, that changed the scope of what compasses a 'past coastal landscape', over refined laboratory analyses of biomolecular records in human or faunal remains, which redefined consumption practices and coastal ecologies, to the study of submerged sediments through DNA or lipid analysis.

This session aims to bring together researchers who work at these multidisciplinary frontiers and who apply new approaches in their respective fields to shape future applications in coastal and maritime archaeology. The session also seeks to include novel approaches of directly combining theoretical advances with practical implementations in the field, as there is growing demand in further developing surveys and excavations of coastal settings. These can include but are not restricted to advances in reconstructing and interpreting coastal and submerged environments, analysing coastal subsistence and ecology, and developing large-scale or multi-evidential approaches to reconstruct and promote the interplay between coastal landscapes and human lifeways.

01 ARCHAEOLOGICAL AND CLIMATIC DATA FROM ELEMENTAL RATIOS USING RAPID ANALYSIS OF SHELL CARBONATE

Author(s): Hausmann, Niklas (Foundation for Research and Technology - Hellas; Department of Archaeology, University of York; Department of Archaeology, MPI-SHH Jena)

Presentation Format: Oral

The chemical composition of carbonate shell from shell midden assemblages is laborious to analyse, yet the information that is locked within the tens of thousands of shell deposits worldwide contains valuable insights on past environments and human ecology.

At present, studies struggle with the acquisition of sufficient amounts of data to make robust interpretations, with either a lack of specimens or a lack of resolution in the applied sampling method, leading to less reliable results.

In general, large amounts of archaeological information is inaccessible due to costly and time-intensive techniques, resulting in small, unrepresentative studies and a lack of comparability between them.

Here we apply Laser Induced Breakdown Spectroscopy (LIBS) in an automated setup to map the Mg/Ca composition of whole shell sections with an acquisition speed of over 4,000 data points per hour and at a resolution of 40–50µm. By assessing the spatial variability of Mg/Ca ratios, this method has the potential to mitigate distorted results while increasing the resolution of derived palaeoenvironmental information. We have successfully tested method on various molluscan species (among others: *Patella* sp., *Ostrea* sp., *Mytilus* sp.) around the world, to develop a rapid and affordable method and to globally advance the reconstruction of climate change.

02 STRUCTURALLY SOUND: SHELL CHEMISTRY AND STRUCTURE IN ARCHAEOLOGICAL INTERPRETATION

Author(s): Burchell, Meghan (Department of Archaeology, Memorial University; Department of Anthropology, McMaster University) - Poduska, Kristin M. (Department of Physics and Physical Oceanography, Memorial University; Department of Chemistry, Memorial University) - Dusseault, Marisa (Department of Physics and Physical Oceanography, Memorial University) - Grant, David (Microanalytical Facility, CREAT, Memorial University)

Presentation Format: Oral

The application of high-resolution stable oxygen isotope sclerochronology (OIS) to archaeological shell midden sites from the Pacific and Atlantic coasts of Canada provides new insights into long- and short-term patterns of hunter-fisher-gatherer subsistence and settlement. Seasonal-subsistence studies using OIS data, from the traditional territories of the Coast Salish, Heiltsuk, Coast Tsimshian (British Columbia), Mi'kmaq (Nova Scotia) and Inuit (Newfoundland and Labrador) confront normative approaches to seasonal patterns of mobility, sedentism and landscape use through the Holocene epoch at both millennial and centennial temporal scales. However, these interpretations could only be achieved through a multi-disciplinary approach, rooted in micro-analytical techniques. By incorporating Scanning Electron Microscopy (SEM) and Fourier Transform Infrared Spectroscopy (FTIR), species-specific sampling strategies can be designed to optimize mollusc data. In particular, FTIR provides not only the opportunity compound-specific data (aragonite vs. calcite), but elucidates crystallinity changes that can indicate remodelling or diagenetic processes. As such, these data can serve as a key screening tool to identify well-preserved specimens that are suitable for radiocarbon dating. This paper explores how archaeologists, working in an interdisciplinary setting can maximize geochemical data from shells. Through the examination of shell macro- and micro-structures, it is possible to refine and separate seasonality from palaeotemperature, and use novel geochemical and biometric data to interpret past environmental and cultural events at the interface of the ocean.

03 GEOCHEMISTRY OF BIVALVE SHELLS AS INDICATOR OF SHORE POSITION OF THE 2ND C. B.C.

Author(s): Mouchi, Vincent (ISTeP, Sorbonne University, Paris, France; LECOB, Sorbonne University, Banyuls-sur-mer) - Emmanuel, Laurent (ISTeP, Sorbonne University, Paris) - Forest, Vianney (INRAP-Méditerranée, TRACES-UMR5068-Toulouse) - Rivalan, André (Université Paul Valéry-Montpellier 3, CNRS UMR5140 "ASM")

Presentation Format: Oral

Fragments of amphorae have been uncovered in the sediment of the Hérault river at Mermian, near Agde, South of France. These remains, dated from the 2nd c. B.C., are covered by a number of accumulated oyster shells. As oysters are marine organisms, their occurrence at a currently fluvial locality can be explained by (1) a shifted Mediterranean Sea shoreline during this period reaching the Mermian locality or (2) the man-made transportation of the amphorae (comprising the oysters) from the shore (further South of Mermian) to the locality where they were discovered. This second possibility could explain the relatively small size of the majority of the shells (the largest specimen is 120 mm long), as the organisms would have been included in an unfavorable environment for growth.

The current state of research on the regional geomorphology prevents the validation of the potential existence of a valid living environment for oysters. The geochemistry of the shells can be of use here by reconstructing physicochemical parameters of the (sea) water, such as salinity. Indeed, the measurement of the stable isotopes of oxygen included in the calcium carbonate structure of the shells can be used to reconstruct values of temperature and salinity of the fluid within which the organisms lived and grew. This technique is fast, cost-effective and widespread in Earth Sciences laboratories.

In this study, two oyster shells directly attached to the amphorae (i.e., older specimens) as well as other specimens from the upper layer of the accumulation (i.e., last specimens attached to the debris) were collected. Approximately 10 samples were performed on each shell in order to obtain a fair “environmental signature” for each specimen. These values were then compared with measurements performed on other specimens from different localities and periods of known environments (e.g., modern specimens) to discriminate the most probable scenario.

04 MULTI-STAGE INVESTIGATION OF DISCONTINUITIES AND HISTORY IN PACIFIC NORTHWEST COAST SHELL MIDDENS

Author(s): Cannon, Aubrey (McMaster University)

Presentation Format: Oral

The depth, extent, and complex depositional history of major shell midden sites on the Pacific Northwest Coast of North America have typically precluded all but the simplest of culture-historical or ethnography-based research designs. An alternative strategy based on defining and delimiting discontinuities in midden formation and economic activity is illustrated in two case studies from the central coast of British Columbia, Canada. Building on earlier culture-historically oriented excavations, subsequent stages of investigation focused on: 1) expanding and verifying local and regional chronologies; 2) documenting initial occupation and abandonment events at and within site locations; 3) estimating the relative intensity of residential activity over time; and 4) determining from faunal remains whether any abrupt changes in the subsistence economy had occurred. The particular and largely contingent archaeological histories that have emerged as a result could not have been foreseen at earlier stages in the research process. In one case, disruptions in local salmon fisheries appear to have led to partial and, for a short term, possibly full village abandonment. This period also coincided with the establishment of a village site at a previously unoccupied location nearby. In the other case, less intensive occupation over millennia gave way, after a period of partial site abandonment, to more intensive village settlement. The latest economic focus also abruptly shifted to fur seal hunting, presumably in response to the beginning of the European fur trade. These complex histories illustrate the value of a more explicit and planned multi-stage approach to shell midden investigation. Such a process may be essential when a lack of prior knowledge of the nature and history of site and regional settlement makes formulation of meaningful and specific research questions all but impossible.

05 COMBINING NON-INVASIVE TOOLS TO INVESTIGATE SHELL MIDDENS

Author(s): Cariou, Elsa (Institut de Géographie et d'Aménagement Régional de l'Université de Nantes; Laboratoire de Planétologie et de Géodynamique de Nantes, UMR CNRS 6112) - Baltzer, Agnès (Institut de Géographie et d'Aménagement Régional de l'Université de Nantes) - Leparoux, Donatienne (IFSTTAR) - Elliot, Mary - Guivel, Christèle (Laboratoire de Planétologie et de Géodynamique de Nantes, UMR CNRS 6112) - Barbin, Vincent (GEGENA², EA 3795, URCA) - La, Carole (Laboratoire de Planétologie et de Géodynamique de Nantes, UMR CNRS 6112)

Presentation Format: Oral

The giant shell middens of Vendée (France) were made of several billions of flat oyster shells accumulated during the second half-part of the Medieval Warm Period (9th to 13th c.). No ancient text mentions a massive oyster-fishing activity along the Vendée coasts during this period. Thus, those middens constitute very precious structures to understand both the medieval management of marine resources, available land and wastes. Unfortunately, most of them are currently buried or covered by modern infrastructures, while others are severely damaged. They are also protected by a prefectural order and excavations on a large-scale are prohibited. Thus, to go further in our investigations and to improve our knowledge in this massive exploitation of medieval oysters along French coasts, non-destructive techniques are required.

In this study, tools extensively used in geology were adapted and combined to answer these problematics. A Ground Penetrating Radar survey was performed across the middens and allowed observing their internal architecture and localizing invisible buried deposits. Then, geophysical data were used to target core-sampling locations. A few cores (less than 10 cm in diameter) were acquired, and shells belonging to different stratigraphical units were sampled. Those shells, supposed to present a chronological order, were prepared for optical and geochemical analysis. First of all, diagenesis was controlled through microscopy, cathodoluminescence, isotopes and elementary analysis. Radiocarbon dating was performed on non-damaged parts of the shells to test the synchronicity of all middens and highlight timelines across deposits. Isotopes and elementary analysis were used to start reconstructing the evolution of palaeoenvironments along French coasts during the entire second half-part of the Medieval Warm Period. This study illustrates how transversal approaches combining archaeology, biology and geology can successfully improve our knowledge of shell middens and their archaeological contexts, using non-invasive techniques.

06 MONITORING EROSION AT TYBRIND VIG, DENMARK. NEW QUANTITATIVE DATA IN AN OLD DEBATE

Author(s): Uldum, Otto (Langelands Museum) - Gregory, David (National Museum of Denmark)

Presentation Format: Oral

The settlement site at Tybrind Vig on the West coast of the island of Fyn in Southern Denmark, has for the past decades been one of the best known sites in the field of submerged landscape archaeology. Documentation methods were pioneered here from the mid 1970s onwards.

It has been known since the mid-1800's that large parts of the near-shore Stone Age landscape is now under water. This was the reason for the large quantities of worked flint that could be found along the Danish shores, and consequently that these remains were to some extent being eroded, and objects moved from their primary deposition with wave action onto the beach. This was also the reason for the discovery of the Tybrind Vig site, where excavations began in 1978, to be recognised as Stone Age settlement site, since worked flint was present on the west facing beach in abundance. This discovery led to extensive excavations between 1978 and 1987, and finally stabilization of parts of the site with geotextile and sandbags.

In recent years scholars have been discussing the extent to which submerged sites and Tybrind Vig in particular are currently being destroyed by erosion. The primary reason why this is believed to happen at a greater rate today is the decline of the protective eel grass (*Zostera*), which supposedly is in decline because of artificial fertilizer being washed out from the ubiquitous farmland. But how fast is this erosion taking place? A new project aims to establish a point of reference by repeat surveying the site with high accuracy RTK GPS, total station and single beam echo sounder to establish the rate of erosion. Alongside this, studies of the historical growth and decline of seagrass on the site are being investigated.

07 REFLECTING FUTURES: SOME ITEMS FOR A RESEARCH AGENDA IN COASTAL ARCHAEOLOGY IN THE NEOTROPICS

Author(s): Colonese, Andre Carlo (University of York)

Presentation Format: Oral

Small-scale coastal fisheries provide a crucial source of food and livelihood to millions of people living in South America. Such coastal economies are founded on long-established knowledge that is deeply rooted in the past. If traditional subsistence strategies are to be of value in maintaining ecosystem function and services, a deeper understanding of their long-term history is required. In this presentation I will reflect upon three crucial themes that feature in the research agenda of coastal archaeology in the Neotropics: Traditional knowledge, conservation biology, and the origins of food production. By narrowing the focus to the Atlantic coast of Brazil I will discuss some examples where coastal archaeology is trying to fill the gaps of other disciplines while aiming to boost its relevance to some pressing issues on the South American continent. I will discuss: 1) the legacy of long-term coastal exploitation to food security in one of the poorest regions of Brazil; 2) the contribution of the archaeological record to conservation biology in the Atlantic Forest coast, one of the world's most threatened tropical biomes; and 3) some recent advances in early plant management and food production in tropical and subtropical coastal areas, with implications for forest diversity and composition. Coastal archaeology in the Neotropics can effectively track the legacy of past fisheries to conservation issues and the socio-economic and cultural profiles of contemporary societies, while also providing indicators for assessing changes in coastal resources through time.

08 LANDSCAPE CHANGES AND MOBILITY OF THE PREHISTORIC COMMUNITIES IN THE WESTERN BLACK SEA COAST (5TH-2ND MILLENNIA BC)

Author(s): Voinea, Valentina Mihaela - Dobrinescu, Catalin Ionut (Museum of National History and Archeology of Constanta) - Caraivan, Glicherie (The National Institute of Research and Development for Marine Geology and Geoecology - GeoEcoMar) - Balasescu, Adrian (Institute of Archeology Vasile Parvan, Bucharest) - Radu, Valentin (National History Museum of Romania, Bucharest)

Presentation Format: Oral

The authors examine the consequences of the Black Sea level changes during 5th - 2nd millennia B.C for the habitat types and paleoeconomics prehistoric communities along the western Black Sea Coast. Starting from 5200/5000 BC the western Black Sea Coast was intensively inhabited by Hamangia communities for over half a millennium, as it is proved by settlements, focused around coastal lakes. Once the sea level increased, the large communities travelled upstream along the paleovalley, leaving behind their settlements covered by water. Archaeozoological analyzes have shown that economy determined the Hamangia communities' mobility adapting to different ecosystems. The Gumelnita communities, as indicated by archaeozoological and ichthyological analyzes, preferred the promontories and high peninsula areas located near fertile soils. The Black Sea level rise in the Final Eneolithic Period resulted in the Delta Danube extension and the settlements' flooding. At the beginning of the Bronze Age, the western coast of the Black Sea is characterized by an apparent lack of settlements and by a landscape scattered by a large number of tumble tombs, specific to the North-Pontic area. This configuration will be overturned by the end of the Bronze Age, when western climatic disturbances are causing massive population migration to the south and east of the Balkan Peninsula, with reverberations up to the current Near East.

For G. Caraivan, C. Dobrinescu and V. Voinea this work was supported by project EASME/EMFF/2015/1.2.1.8 "Western Black Sea Underwater Cultural Touristic Routes " and for A. Balasescu and V. Radu this work was supported by a grant of the Romanian Ministry of Research and Innovation, CCCDI - UEFISCDI, project number PN-III-P4-ID-PCE-2016-0676, within PNCDI III.

09 INFANT AND CHILDHOOD DIETARY PRACTICES OF THE OLD BERING SEA CULTURE

Author(s): Harris, Alison (Archaeological Research Laboratory, Stockholm University; Department of Archaeology, University of York) - Dury, Jack (Archaeological Research Laboratory, Stockholm University; Arctic Centre, University of Groningen) - Alexander, Michelle

(Department of Archaeology, University of York) - Dobrovolskaya, Maria (Department of Physical Anthropology, Russian Academy of Sciences) - Eriksson, Gunilla - Lidén, Kerstin (Archaeological Research Laboratory, Stockholm University)

Presentation Format: Oral

Located at the confluence of the Bering and Chukchi Seas in Northeastern Siberia, the Ekven settlement and cemetery complex (~2200 - 1200 BP) has drawn archaeological attention for its elaborate mortuary behaviour and its role in the development of the Yupik and Inuit cultures. Since the collapse of the Soviet Union, archaeological investigations of the site and surrounding region targeted past population demographics, subsistence, and the development of social complexity in relation to sea mammal hunting practices. In contrast, the quotidian lives of individuals, and women and children in particular, remained largely unexamined. In this paper, we draw on the recursive relationship between individual actions and social transformation to investigate the interplay between biosocial categories (age, sex, health status) and dietary practices in ancestral Yupik societies, as represented by the Ekven skeletal assemblage. Previous research employing stable isotope analysis of bulk bone collagen from this cemetery sample suggested different dietary practices for adults and non-adults. To further investigate this possibility and provide a more nuanced exploration of diet over the lifecourse, we measured isotopes of carbon and nitrogen in serial sections ($n = 496$) from permanent first and second molars, representing the period of breastfeeding through weaning, and later childhood diet. We sampled the teeth of adult females ($n = 10$), males ($n = 9$) and subadults ($n = 4$) dating to the Old Bering Sea (2200 - 1500 BP) and Birnik (1500 - 800 BP) cultures to investigate possible interactions between biological sex, age, health status, and diet. New radiocarbon dates from the Ekven cemetery anchor the isotope data to a secure chronological framework, while archaeological and ethnographic evidence inform our interpretation with respect to gender- and age-related consumption patterns.

10 OPTIMAL FORAGING MODELS, HUMAN DISPERSAL, AND ADAPTATION IN ISLAND SOUTH EAST ASIA: THE CASE FROM LAILI CAVE, TIMOR-LESTE

Author(s): Hawkins, Stuart - Litster, Mirani - O'Connor, Sue (The Australian National University)

Presentation Format: Oral

In the last 15 years some scholars have turned to the predictive power of Optimal Foraging Models (OFM) to argue that early modern humans would have dispersed rapidly from Sunda to Sahul during the late Pleistocene along island coastlines using maritime technology and taking advantage of concentrated marine resources in an Ideal Free Distribution scenario. While there are many criticisms of these models, explicit testing of OFM predictions using archaeological data has yet to be conducted in the region. Here, we use quantified zooarchaeological (vertebrate and invertebrate) and lithic data-sets to test OFM predictions of changing human subsistence and settlement patterns at Laili Cave in Timor-Leste, which at ~ 44.6 ka to 11 ka is currently one of the oldest modern human occupation sites in Wallacea. Our data suggest that human occupation was continuous at the cave and focused on the exploitation of abundant local chert stone resources and broad spectrum foraging of a wide range of fauna. Settlement increased in intensity right up to the terminal Pleistocene. Optimal decisions favoured mobility between coastal marine resource patches and proximal riverine and forested environments. After the LGM, however, as occupation at the cave appears to have intensified, the acquisition of mangrove and riverine molluscs also intensified, possibly in response to increased precipitation, and this appears to have resulted in resource depression as seen through a decline in the size of freshwater *Stenomelania* mollusc specimens. This study demonstrates the value of OFM in explaining foraging decisions using quantified records, which will ultimately allow testing of the higher-level evolutionary theories relating to human dispersal and adapted settlement patterns and subsistence behaviour in ISEA to meet the environmental and climatic challenges of these insular landscapes over long time periods.

11 THE SIGNIFICANCE OF OPEN OCEAN AND TIDAL CURRENTS IN THE EARLY MARITIME MIGRATION TO AUSTRALASIA

Author(s): Kuijjer, Eveline - Marsh, Robert - Haigh, Ivan D. - Farr, R. Helen (University of Southampton, Southampton)

Presentation Format: Oral

Australasia was colonised at least 50,000 years ago, and possibly even 65,000 years ago. Despite sea levels being around 75 m lower than at present around this time, water crossings had to be made from islands in Southeast Asia to reach the Australian continent. The maritime environment therefore plays a central role in this key event in the peopling of the world. Most researchers now accept a scenario of staged migration across the islands of Southeast Asia. However, the seafaring capabilities and skills of the early colonisers are subject to debate, and the nature of the colonisation process is still poorly understood. The effects of the maritime environment, especially of open ocean and tidal currents, on movement through the region are now hot issues for study.

Here, these effects are explored with high-resolution computer models of open ocean and coastal tidal circulation, forced with modern-day climate data. Lowered sea levels are simulated as a first approximation of palaeogeographic conditions that affected the maritime environment in the distant past. Results demonstrate how the dynamic nature of maritime environment affects timescales and trajectories for movement through the region. It is shown that dispersal to the Australian coast through drift alone is highly unlikely. However, open ocean and tidal currents could have aided early seafarers in navigating from the islands in Southeast Asia to Australasia. The results illustrate how a new perspective can be gained on a maritime archaeological issue by applying a novel approach of a multidisciplinary nature.

12 A PREDICTIVE MODEL FOR TERRESTRIAL AND SUBMERGED LANDSCAPES, MURUJUGA (DAMPIER ARCHIPELAGO), NORTH WEST SHELF, AUSTRALIA

Author(s): McDonald, Jo - Veth, Peter (CRAR+M, UWA)

Presentation Format: Oral

The Dampier Archipelago (properly known as Murujuga) is a richly engraved and modified cultural landscape in north-western Australia. But this arid-maritime archipelago of 42 islands on the Pilbara coast in north-west Australia has only been in existence since the mid-Holocene. When people first used this arid landscape, it was situated more than 160 km from the coast. The Pilbara archaeological record – and that from offshore Barrow Island – demonstrates human responses through over fifty thousand years of environmental change. Drowning of the North West Shelf has submerged much of the human occupational evidence from the first 40,000 years. A current project on Murujuga has been documenting the archaeological record from the outer islands of the Archipelago: a landscape which was cut-off by rising sea levels from c.10,000 to c.7,000 years ago. This paper discusses how the existing predictive model for rock art and other terrestrial site complexes can be mobilised to explore the submerged landscapes beyond Murujuga. This predictive model recognises the changing dynamics of people in the early Holocene on this radically changing coastal plain. This model is being developed to assist in improved understandings of the social changes wrought by sea-level rise and subsequent environmental changes on mobile Aboriginal groups exploiting both maritime and arid hinterland environments. A new model will be presented with predictions for submerged site locales based on the interpretation of extant terrestrial records on the islands.

13 ADVANCING SCIENTIFIC METHODOLOGIES FOR THE INVESTIGATION OF SUBMERGED ARCHAEOLOGICAL LANDSCAPE DEPOSITS

Author(s): Momber, Garry (Maritime Archaeology Trust; University of York; Maritime Archaeology Ltd) - Rich, Sara (Department of Art, Appalachian State University; Maritime Archaeology Ltd) - Heamagi, Christin - Mason, Brandon (Maritime Archaeology Ltd; Maritime Archaeology Trust) - Gillespie, Jan (Maritime Archaeology Trust)

Presentation Format: Oral

Recognition that submerged landscapes can contain significant cultural resources is now becoming widely accepted. As such, concerted efforts are being applied to characterise drowned terrestrial deposits using geophysical and acoustic sources with validation by cores. This data is vital to provide a context for human activity on a large scale but the resolution is invariably insufficient to identify and learn much from individual archaeological sites. This lacuna is being addressed at archaeologically rich areas in the Solent (southern England) and around the Farasan Islands in the Red Sea. Here, photogrammetry and visual inspection of the submerged landscapes is being used to provide insights into the relationship between the palaeo-landscape and areas of human occupation. This is increasingly necessary as we look for transient sites where the material culture would have been taken away once people moved in search of new resources. These ethereal sites have primarily manifest themselves in the form of debitage scatters but at Bouldnor Cliff in the Solent, we have been looking at worked timbers from large oak trees that can be used as markers of human settlement. The extent of well-preserved environmental and organic archaeological material makes Bouldnor Cliff one of the most (if not the most) significant Mesolithic site in the UK. As such, it is proving to be an ideal testing ground to advance research methodologies. In this talk we will present some of the current work in the Red Sea and the Solent including interpretation of the subsea geomorphology, the value of palaeo-environmental indicators and the significance of DNA to the understanding of human dispersal. We will also address the need to understand the footprint of these ancient assemblages in a way that will better inform curators when trying to manage and mitigate damage to comparable archaeological sites ahead of commercial maritime development.

14 DIVING/COMPUTING: RECONCILING LOW BUDGET AND HIGH IDEALS FOR DIGITAL DIVIDENDS

Author(s): Mason, Brandon (Maritime Archaeology Ltd)

Presentation Format: Oral

Continual advances in digital recording technologies present opportunities to squeeze the most value out of the limited windows and resources available in archaeological fieldwork, especially when undertaking expensive and/or time-limited survey in remote locations or challenging conditions, in this case underwater situations and depths of over 40m.

Working in a variety of environments and contexts around the world over the past twenty five years, the Maritime Archaeology Trust has developed a range of techniques to compliment the technology to enable us to capture more effective information from shorter windows of opportunity than ever before. Presenting case studies ranging from the to the shallow waters of the Arabian Gulf to the deepest, blackest and also the very brightest conditions that the English Channel has to offer, as well as brief intertidal glimpses of the Romano-British Solent, the paper explores how developed photogrammetry workflows have enabled us to achieve a deeper understanding with a greater level of impact and with less funds than ever before.

In addition to presenting some of the methods utilised to achieve high impact visualisation, data capture and analysis, this paper explores the digital strategies and workflows necessary to deliver a successful and efficient survey result, while also considering the integrated opportunities for digital collaboration, dissemination and archive.

15 MARINE ARCHAEOLOGICAL PROSPECTION OF THE BELGIAN NEARSHORE AREA

Author(s): Mlssiaen, Tine (Flanders Marine Institute) - Marte, Ricardo (Ghent University)

Presentation Format: Oral

Nearshore areas are known to be rich in archaeological remnants, yet they are rarely studied due to the technological challenges posed by shallow water depths, wave action, strong currents and large tidal range. At the same time these areas are often the focus of major infrastructural works which form an important threat to the heritage. In recent years, geophysical investigations have been carried out at different sites along the Belgian coast for geo-archaeological and palaeogeographical prospection. One of the target sites was Raversijde which is known for its archeological artifacts, mainly from Roman and medieval times. Very high resolution 2D subbottom profiling using a parametric echosounder has evidenced a highly complex system of palaeogullies and tidal channels, some of which can be linked to the early medieval coastal barrier formed by the Testerep peninsula and the drowned settlement of Walraversijde. The parametric echosounder also proved a highly effective tool to map buried peat layers, even in extremely shallow water (up to 1 m water depth). Using a novel multi-transducer parametric echosounder (SES-2000 Quattro), unique 3D imaging of buried peat excavation patterns was possible with unprecedented detail (dm level). 3D data obtained off the coast of Ostend furthermore revealed remnants of the old medieval harbor entrance which are now buried below the intertidal beach. These results set a new standard for shallow water research and open important new perspectives for geoarchaeological studies in nearshore and intertidal areas.

16 NEW RESEARCH ON THE UNDERWATER ARCHAEOLOGICAL REMAINS OF LAKE KOORKÜLÄ'S VALGJÄRV IN SOUTHERN ESTONIA

Author(s): Virtanen, Kalle (Helsinki University)

Presentation Format: Oral

My PhD study focuses on the remains of a pile dwelling at the bottom of Lake Valgjärv in southern Estonia. The site is so far the only known pile-dwelling in Estonia. Previous research in Valgjärv has been carried out by Estonian archaeologist Jüri Selirand. Encouraged by the results of Selirand, I have had the possibility to initiate further research on the site. The starting point in the initiative has been to chart the extent of the site via different methods. Simultaneously, my working group has endeavoured to develop methods to survey archaeological remains extending over larger areas in relatively shallow waters, such as the Valgjärv site. Of the methods applied, aerial photography together with tachymeter survey combined with diving has so far yielded the best results. The aerial photographs have been oriented and fixed on the local map coordinates and rectified as accurately as possible. This enables us to visualise the heritage hidden under the waves in a way that was previously not possible on this site. To encounter the many challenges our specialized working environment brings about, I have also started a co-operation with Zagreb's University's Laboratory for Underwater Systems and Technologies (LABUST). LABUST has developed an autonomous surface platform, which carries an accurate GPS device, a multibeam sonar and a camera with it. The platform is propelled by its own electrical engines. After joined Field work to document the structures in Valgjärv, we are currently processing the photogrammetric- and sonar data using Agisoft PhotoScan software with promising results. One aim of the work is to produce a 3Dmodell of the site. The radiocarbon samples taken from the piles and timber structures resting on the bottom of Lake Valgjärv give evidence of three separate phases of settlement or other activity (3500BC-3100BC, 410BC-150BC & 560AD and 980AD).

17 UNDERSTANDING HUMAN INTERACTION AND CHANGES IN THE MESOLITHIC AND PALAEOLITHIC ENVIRONMENTS BY UTILISING GEOTECHNICAL DATA FROM OFFSHORE WIND FARMS

Author(s): Heamagi, Christin (Maritime Archaeology Trust)

Presentation Format: Oral

This paper will explore the challenges and advantages of undertaking development led geoarchaeology in the marine zone by using results derived from wind farm developments around the UK coasts.

Over the last few years a notable change has occurred both in the attitude towards and the methods used for marine geoarchaeology in the development led offshore archaeological field from the UK.

Thanks to support from Historic England and an increased understanding of taking a staged approach, developers have, if sometimes reluctantly, started to understand why geoarchaeological analysis and assessment must take place and how the information contributes to the wider research framework.

The research potential for environmental indicators from the North Sea is very high. Studies such as the North Sea Palaeolandscape Project (University of Birmingham, 2011) and Vince Gaffney's Mapping Lost Worlds are providing good background knowledge across large areas. In contrast to the broad approach of the research projects, development led archaeology is mostly tied to the cores and material collected by developers for their own purposes, which are often from a relative defined area. Therefore, we as marine geoarchaeologists looking to advance methodologies, must find the best way forward in understanding and utilising the information we can gather from the geotechnical core material while encouraging more comprehensive geoarchaeological assessments and analysis to take place.

This presentation will summarise the current status and methodologies of offshore marine geoarchaeology in the UK by focusing on a number of case studies where wind farm developers have not only protected the more visible shipwrecks within their development

area but also supported the study of less obvious indicators of submerged landscapes and environmental indicators preserved below their wind turbines.

18 OLD HERITAGE, NEW APPROACHES! HOW ELECTRICAL RESISTIVITY TOMOGRAPHY CAN AID IN THE RECONSTRUCTION OF HISTORY

Author(s): Simyrdanis, Kleanthis (Laboratory of Geophysical-Satellite Remote Sensing, Institute for Mediterranean Studies) - Moffat, Ian - Kowlessar, Jarrad - Bailey, Marian (Archaeology, College of Humanities, Arts and Social Sciences, Flinders University) - Papadopoulos, Nikos (Laboratory of Geophysical-Satellite Remote Sensing, Institute for Mediterranean Studies) - Roberts, Amy (Archaeology, College of Humanities, Arts and Social Sciences, Flinders University)

Presentation Format: Oral

The use of Electrical Resistivity Tomography (ERT) in archaeological applications has gained more popularity in recent years. Rarely though, is it used in marine environments. This study explores the innovative approach taken by a multidisciplinary team, using a suite of methods to reconstruct the historically significant river barge Crowie, in South Australia. The significance of barges to the South Australian economy was enormous, and had massive impacts on both the colonial and Indigenous people who lived along the Murray River. Many of these barges have been lost, sunk into the turbid Murray River water, and what little is known about these barges, is primarily found in historic newspaper records. Crowie was arguably the most significant barge to trade along the river, and sunk at its moorings toward the end of the rivertrade era. Due to the turbidity of the water however, traditional underwater survey was not possible. Nor was the retrieval of Crowie due to preservation issues. Prior geophysical studies, including side-scan sonar and multiscan survey had been undertaken, in combination with archival research and oral interviews with Aboriginal people who had recollection of Crowie and associated events. With these prior studies in mind, the decision was made to trial a new and innovative approach to the analysis of the Crowie. ERT was used to create a 3D reconstruction of the Crowie barge to great success. The results of this geophysical method demonstrated the applicability and effectiveness of ERT as a 3D reconstruction tool for high resolution mapping; not only of submerged and buried wrecks, but of any submerged construction in marine environments.

a. USING GEOCHEMISTRY OF ARCHAEOLOGICAL SHELLS TO ESTABLISH ENVIRONMENTAL BACKGROUNDS AND MONITOR ANCIENT ANTHROPOGENIC CONTAMINATIONS

Author(s): Cariou, Elsa (Institut de Géographie et d'Aménagement Régional de l'Université de Nantes; Laboratoire de Planétologie et de Géodynamique de Nantes, UMR CNRS 6112) - Elliot, Mary - Guivel, Christèle - La, Carole - Lenta, Laurent (Laboratoire de Planétologie et de Géodynamique de Nantes, UMR CNRS 6112)

Presentation Format: Poster

Ostrea edulis, the endemic oyster of the western European coasts, is particularly abundant in coastal archaeological sites. During the animal's lifespan, it regularly secretes layers of calcium carbonate which incorporate elements from the surrounding water. As a result, geochemical profiles derived from these shells can potentially provide a record of the evolution of water chemistry. In coastal waters, the local concentration of metals reflects natural sources (erosion of geological substrate through mechanical and chemical processes), and anthropogenic inputs.

The aim of this study was to test if the *O. edulis* shell composition reflects the lead (Pb) content of the surrounding surface sediments. We have measured Pb/Ca ratios on shells of modern and medieval samples, using a LA-ICP-MS. Modern samples were collected alive in 2 sites in the Bay of Brest and 1 site in the Bay of Bourgneuf (West coast of France). In those sites, the lead content of the surface sediments was measured, with values around 110, 45 and 20 ppm (dry weight) respectively. Archeological samples were collected in three medieval shell deposits located along the West coast of France, near the localities where modern samples were collected.

Comparison of modern specimens shows that Pb/Ca concentrations recorded by oysters are reproducible within a site. With mean values ranging from 0.08 to 0.44 $\mu\text{mol/mol}$, shell Pb/Ca values and surface sediment Pb content show a positive linear relationship. The low Pb/Ca values (0.03-0.05 $\mu\text{mol/mol}$) recorded in the medieval oysters collected sites in Vendée most probably reflect the environmental background level of Pb in surface sediments along Vendée coasts (estimated around 10 ppm d.w. according to the relationship).

This study highlights the potential of archaeological flat oyster shells as a tool to establish environmental background levels of some major contaminants such as Pb, and quantify more precisely modern or archaeological anthropogenic contributions.

b. METHODOLOGICAL DEVELOPMENT IN MARITIME ARCHAEOLOGICAL SITE RECORDING AND SURVEY

Author(s): Alvik, Riikka (Finnish Heritage Agency)

Presentation Format: Poster

Photogrammetry is known for long as a documentation method also in underwater archaeology. Now there is software available to make the photogrammetry based 3D modelling of archaeological sites more easy and accessible to everyone. Underwater conditions make research often demanding specially in the Baltic. Visibility is often poor and water is dark and cold. Archaeologists very seldom see their research target in total and there is also variation in horizontal and vertical visibility. That is why the lenses of the camera see often better than human eye. For 3D modelling it is possible to use either still photos or video. Because of limited diving

time, video is often preferable: There is an opportunity to fill the possible holes in model and more frames to use. Because of bad visibility, often the amount of photos needed is counted in thousands rather than hundreds.

What are the pros and cons of photogrammetry and 3D – modelling? In good or even modest underwater conditions it might be possible to shoot enough pictures or video for creating a model. It is time economical and what is even more crucial, it is very accurate for measuring. You can recognize and study different structures, fastenings, artefacts, equipment and materials and site formation. For the protection and management of the sites, repeatedly conducted 3D-models can work as a tool for monitoring the condition of the sites. During excavation, it is a tool for documenting the layers and reconstructing the site in 3D. In this paper the advantages and challenges of photogrammetry and 3D modelling at archaeological sites in the Baltic waters will be discussed.

c. RECONSTRUCTING THE INTERNAL ARCHITECTURE OF GIANT MEDIEVAL SHELL MIDDENS WITH THE GROUND PENETRATING RADAR (GPR)

Author(s): Baltzer, Agnes (LETG UMR 6554, Institut de Géographie et d'Aménagement Régional de l'Université de Nantes) - Cariou, Elsa (LETG UMR 6554, Institut de Géographie et d'Aménagement Régional de l'Université de Nantes; Université de Nantes, Laboratoire de Planétologie et de Géodynamique, UMR CNRS 6112) - Leparoux, Donatienne (IFSTTAR) - Dupont, Catherine (CReAAH, UMR 6566)

Presentation Format: Poster

The giant shell middens of Vendée (France) were made of several billions of flat oyster shells accumulated during the second half-part of the Medieval Warm Period (9th to 13th c.). No mention of a massive oyster-fishing activity along the Vendée coasts, during this period, was found in ancient texts. Thus, those middens constitute very precious structures to understand both the medieval management of marine resources, available land and wastes. Unfortunately, most of them are currently buried or covered, while others are severely damaged. They are also protected by a prefectural order and excavations on a large-scale are prohibited. Thus, to go further in our understanding of these massive deposits, non-destructive techniques, such as geophysical surveys, are required.

Ground penetrating radar (GPR) allows characterizing internal structures from surface measurements. It is well known as a tool for sedimentological analysis, and for archaeological recognition in natural deposits, or in anthropogenic structures. It was recently used in Brazil to determine the internal structure of several large Neolithic shell mounds, and localize archaeological targets like burials and ceramic materials (Rodrigues et al., 2009, 2015). However, until now, GPR has only been occasionally used to investigate shell middens.

In this study, a GPR survey was conducted in the giant shell middens of Vendée and coupled to a discreet core-sampling campaign (see Cariou et al., 2018 for Saint-Michel-en-l'Herm middens). This prospection reveals successive sigmoid sedimentary units, separated by thin soils and trampled surfaces. Those structures are interpreted as periodic massive shell inputs separated by periods of non-deposition and trampling, highlighting repeated lateral displacements of "the active input area". Combined with the general shape of the middens, these structures also show significant differences in the "building strategy" amongst middens, suggesting a same first aim (storing kitchen wastes), but different secondary purposes (channel infilling? jetty? road stabilization?..).

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FISHING FOR KNOWLEDGE IN A SEA OF DATA

Theme: Theories and methods in archaeological sciences

Organisers: Lee, Edmund (Historic England) - Münster, Sander (Technische Universität Dresden)

Format: Session with presentations of 6 slides in 6 minute

With the increasing move towards Open Data and Open Access for outputs of archaeological research, we need also to develop mechanisms for supporting and improving synthesis, knowledge management, and knowledge transfer of cultural heritage information, for the right audiences, through developing better ways of data sharing along with promotion of useful information standards for heritage information.

This discussion session will explore what are the major shared challenges to overcome, such as potential skills gaps for decision makers, or staff and researchers with limited opportunities to acquire or update technical knowledge along with finding better ways to make the data that we record and keep in digital archives re-useable.

The EAC 2014 Amersfoort Agenda (<https://www.europae-archaeologiae-consilium.org/eac-occasional-papers>) set out 3 key areas for research and related activities using digital technologies and associated methods:

- Use emerging digital technologies to share, connect and provide access to archaeological information; this will require improved collaboration and the development of (and participation in) European networks.
- Encourage cooperation with other disciplines and share data in order to create a shared benefit.
- Aim for the greatest possible access to digital archaeological resources for various user groups and exploit digital databases to their full potential, including uses for the greater public.

The session will comprise short presentations addressing aspects of these 3 key themes, and seek to draw together in discussions those people, from various backgrounds in digital cultural heritage and archaeological research institutions, interested in developing greater cooperation across Europe on ways to address these issues.

01 BEYOND NUMBERS OR WORDS – HOW DO RESEARCHERS IN DIGITAL CULTURAL HERITAGE PERFORM RESEARCH?

Author(s): Muenster, Sander (TU Dresden)

Presentation Format: Oral

Within my contribution, I would like to introduce a multi-angled view on how researchers in digital cultural heritage do perform research.

A community perspective: Who are stakeholders of cultural heritage? What are topics of scientific discourse? Who funds digital heritage research? To answer these questions we investigated around 5000 articles in the field of digital cultural heritage: Most of the researchers are Europeans and have a disciplinary background in the humanities and in particular archaeology. Moreover, a scientific discourse is closely related to practical work in terms of projects.

A usage perspective: How do researchers in digital heritage practice research? How does they cope with information and digital data and tools? We monitor these aspects on micro and macro levels via surveys, case study research and user observation. What are findings? Investigations on information behavior in the field of digital heritage carried out during the 2000's examined major discrepancies between researchers' needs as well as digital tools and repositories available at that time. Even if some of the deficits have been improved nowadays, challenges such as low data quality, problematic access along with usability problems are still issues encountered for information systems and tools in digital cultural heritage.

An epistemic view: How does digitization changes research approaches in the field of cultural heritage? What marks a disciplinary culture of "digital" cultural heritage? We investigate several fields by employing empirical and theoretical approaches. While there is a wide scope of topics addressed, data access seems to be the most crucial point. Both data acquisition and management are the most prominent research areas. Topics are widely influenced by current trends in technology and society, which may be caused by the opportunities to gather money for projects by referring to up-to-date issues.

02 CONNECTING ARCHAEOLOGY AND ARCHITECTURE DATA

Author(s): Fernie, Kate (2Culture Associates Ltd) - Gavrilis, Dimitris (Athena Research Centre, Digital Curation Unit) - Corns, Anthony (The Discovery Programme: Centre for Archaeology and Innovation Ireland)

Presentation Format: Oral

Connecting datasets produced by organisations from several different countries presents significant interoperability challenges. In this paper we describe the approach taken in CARARE, the lessons learned in integrating more than two million metadata records from databases across Europe and the latest developments in the schema to support innovation in modelling the archaeological and architectural heritage and to enhance support for linked and contextual data.

The CARARE metadata schema is designed to foster common approaches and best practices in the description of the digital archaeological and architectural heritage. Based on existing standards including CIDOC, MIDAS and LIDO, the schema was designed as a harvesting protocol to support metadata aggregation for Europeana. Mapping the schema to the Europeana Data Model (EDM) enabled integration of the datasets in Europeana while ensuring their integrity and semantics. We have described the interoperability challenges that we faced and the solutions developed for the first version of the CARARE schema in previous papers. This paper looks at the lessons learned and work to develop an RDF-friendly version of the CARARE schema. Our aim with this new version of the schema is both to enhance support for Linked and Contextual data, and to improve support for developers using the schema in data capture systems and in 3D environments such as HBIM.

03 ANALOGUE PRACTICES IN A DIGITAL WORLD

Author(s): McKeague, Peter (HES Historic Environment Scotland)

Presentation Format: Oral

Although digital survey and recording techniques are now commonplace in archaeological fieldwork and reports are prepared electronically, archaeologists are not delivering best value for the data they create. Licencing and copyright issues aside, too often the digital product is a pdf report: skeuomorph of the analogue. The electronic format is just a digital copy of a familiar media format adding little if anything to the user's experience. In committing to print, the richness and value of the data is fossilised on the page. Although easy to publish and often no more than the client needs, reuse is restricted to reading and sharing. The PDF is an inefficient use of expensively gathered data. This short presentation will explore two case studies highlighting the benefits of 'doing more with data'. The first case study will highlight the information loss in only publishing site plans and surveys as illustrations in a paper format rather than thinking in terms of how that data contributes to the wider understanding of the archaeological landscape in a digital environment. The second case study considers the re-use of tabulated scientific data from radiocarbon determinations to support Bayesian analysis of the dataset – offering something other than the sum of the parts.

New technologies need new approaches yet the profession perseveres with established practices reinforcing the siloed mentality of roles and organisations. In a world of Big Data it is time to think beyond the project, to work collaboratively to maximise the potential of digital data to deliver value and encourage easier reuse across the profession to drive knowledge and understanding forward.

04 ENABLING EUROPEAN ARCHAEOLOGICAL RESEARCH: THE ARIADNE E-INFRASTRUCTURE

Author(s): Richards, Julian (Archaeology Data Service; University of York) - Niccolucci, Franco (PIN - University of Florence) - Wright, Holly - Green, Katie (Archaeology Data Service; University of York)

Presentation Format: Oral

Research e-infrastructures, digital archives and data services have become important pillars of scientific enterprise that in recent decades has become ever more collaborative, distributed and data-intensive. The archaeological research community has been an early adopter of digital tools for data acquisition, organisation, analysis and presentation of research results of individual projects. However, the provision of e-infrastructure and services for data sharing, discovery, access and re-use has lagged behind. Many big archaeological research questions need to be addressed at European level using resources that cross over modern political and administrative boundaries - but sharing archaeological information across Europe is a challenge, given differences in languages and vocabularies. These even extend to apparently simple but fundamental concepts such as period terms. This situation is being addressed by ARIADNE: the Advanced Research Infrastructure for Archaeological Dataset Networking in Europe. This EU-funded network has developed an e-infrastructure that enables data providers to register and provide access to their resources (datasets, collections) through the ARIADNE data portal, facilitating discovery, access and other services across the integrated resources. This short contribution will present the ways in which ARIADNE is seeking to address the challenges of European data interoperability, including the mapping of vocabularies and metadata to agreed data standards and ontologies, and it will unveil the next stages being planned for the ARIADNE e-infrastructure.

05 FROM DIGITISATION TO A DIGITAL MINDSET. INSIGHTS FROM DEVELOPING A DIGITAL ARCHAEOLOGICAL PROCESS IN SWEDEN

Author(s): Larsson, Asa (Swedish National Heritage Board)

Presentation Format: Oral

The Swedish National Heritage Board has been developing a digital Historic Environment Record (HER) that will be implemented in 2018. The HER will contain not just publically accessible online information about ancient sites and monuments, but also data about archaeological surveys and excavations, as well as a digital archive for storing reports, artefact lists and field documentation. A registration feature will allow field archaeologists and heritage managers to register new data directly into HER, making sure the information is current as well as in accordance with national standards - a digital archaeological process. The complex project, integrating requirements from government agencies, contract archaeologists, researchers and museum curators, has been a learning experience for all involved. No digital product can ever meet every requirement, it is therefore important that the data is Open Access and FAIR. Heritage specialists and technical developers need to work closely together and learn to communicate with each other, in order to ensure long term viability.

Sharing and analyzing archaeological data is made problematic due to diverse and analogue practices for recording information. No matter how advanced the digital solution, it will always be dependent on the human factor. I will present some valuable conclusions drawn from working in this large and ambitious digitisation project. I will also present some important considerations for future developments if we want the heritage sector (archaeology, museums, research and management) to be able to make use of the opportunities of digitisation to create new knowledge. It is not enough that there are digital tools available to us, we need wide-ranging changes to every level of archaeological practice: how we gather, present and store information.

06 MAKING THE DATA AVAILABLE: TII DIGITAL HERITAGE COLLECTIONS

Author(s): Swan, Ronan (Transport Infrastructure Ireland) - Corns, Anthony (Discovery Programme) - Harrower, Natalie (Digital Repository of Ireland) - Butler, Lillian (Transport Infrastructure Ireland) - Monaghan, Evie (Royal Society of Antiquaries of Ireland) - Kennedy, Louise (Discovery Programme)

Presentation Format: Oral

Over the past sixteen years considerable archaeological work has been undertaken on road and light rail schemes managed by Transport Infrastructure Ireland, with more than 2,500 archaeological excavations undertaken in this period. A key principle has been to ensure that the data derived from these works is made as accessible as possible. A major step forward in achieving this has been the successful launch in 2017 of the TII Digital Heritage Collections in partnership with the Digital Repository of Ireland and the Discovery Programme. These collections currently include more than 1,500 archaeological reports as well as audio-books, short videos, and seminar papers. The architecture of the collections envisages the continual growth of the data sets, and the collections are integrated with national data portals (www.heritagemaps.ie) and are designed to integrate with European datasets such as Ariadne (<http://ariadne-infrastructure.eu/>). Making these collections available complements the Irish government's open data policy (www.data.gov.ie), and their deposit in a national trusted digital repository ensures their long-term preservation while also aligning with the goals of FAIR data. This paper will highlight the importance of collaboration across different disciplines (digital archives and archaeological), particularly how such institutional and organisational collaboration can lead to a positive outcome. It will also explore the important distinction between the access portal and the repository itself.

07 USING TEXT MINING TO UNLOCK THE HIDDEN KNOWLEDGE IN DUTCH ARCHAEOLOGICAL REPORTS

Author(s): Brandsen, Alex (Leiden University; Leiden Centre for Data Science) - Wansleeben, Milco - Verberne, Suzan (Leiden University)
Presentation Format: Oral

Over 60.000 Dutch archaeological research reports are available online, and this number is growing by around 4.000 a year. Much of this grey literature threatens to end up in a proverbial graveyard, unread and unknown. However, the information contained in these documents can be of immense value.

Currently it is only possible to search through the metadata of these documents, mainly via the Archis database and DANS repository. However, these metadata are often limited and sometimes inconsistent, and don't capture the 'by-catch opportunity'; i.e. a single Bronze Age find within a large Medieval excavation

To effectively index these texts, Named Entity Recognition (NER) is needed to correctly identify and distinguish between archaeological concepts. Standard approaches to NER (in related fields), are insufficient to deal with the peculiarities of these concepts.

Some research has already been done on NER in archaeological texts, e.g. in the ARIADNE & Open Boek projects, but these are not combined with full-text search, or tend to focus on limited entity types, and not the full breadth of archaeological concepts.

This paper will present the first phase of AGNES, in which machine learning is used to perform NER. The project is in cooperation with LIACS, who provide a computer cluster with high computing power, allowing for the use of more resource intensive techniques. The identified entities are combined with a full-text index to create an effective online search tool.

499 TOWARDS AN ARCHAEOLOGY OF MAKING

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Adams, Sophia (University of Glasgow) - Miller Bonney, Emily (California State University Fullerton)

Format: Session with presentations of 6 slides in 6 minute

Scholars see evidence for specialist skills in a broad array of prehistoric artefacts from around the world. Such identifications rest on the assumption that the dominant material from which an object is made defines the skills the artisan needs. Although this link between specialist, object and materials is widely accepted there is little site-based evidence for such full-time specialists. Recent discussions of prehistoric artisanal skillsets have highlighted both the breadth of skills required to make specific objects and the considerable overlap across seemingly different crafts. This session will explore the evidence for a redefinition of the specialist that does not depend primarily on the dominant material. Do specific sites or artefacts indicate the presence of cross-craft activities with people specialising in certain ways of making, for example the controlled use of heat or carving different substances? Can we identify the knowledge that transcends traditionally defined craft boundaries? Physical craft skills may be learnt through the manipulation of materials and tools, do these in turn have a role in shaping what a craftsman does? Are specialists defined by the type of artefact produced rather than the materials or methods? The aim of this session is to test ideas, compare evidence and debate a revised approach to studying and discussing production activities in prehistoric contexts. Participants are asked to present short papers focussing on specific archaeological sites or artefact assemblages or practical craft experience that explores an alternative archaeology of making. The remaining time will be devoted to discussion.

ABSTRACTS

01 RECONSTRUCTING THE MAKERS

Author(s): Adams, Sophia (University of Glasgow)

Presentation Format: Oral

In 2018 we have a range of analytical techniques available to examine the construction of prehistoric artefacts. We can determine the materials from which they were made, the processes by which they were formed, the sources of the materials and the location at which they artefacts were made. We also benefit from the increased interest and efforts put into recreating and reconstructing objects through experimental archaeology. Yet there is still a tendency to describe objects as made by metalworkers, potters, woodworkers, flint-knappers and so on, thereby interpreting the skill set of the maker in relation to the dominant material of the final product. Prehistoric craftworkers are described by terms derived from periods of literacy and by the specialism of the craftworkers who produce replicas and reconstructions: smiths, potters, carpenters, weavers.

This paper calls for a revision of our interpretation of prehistoric makers based on the empirical evidence we now have available; evidence that can indicate the context of production, the association between the sources and use of different materials. Comparisons may be drawn between the workable qualities of compositionally different materials and we may explore the complementary skill sets that are required for and developed through producing different artefacts. It promotes a more critical use of existing craftworker terminology to describe past production and specialist skill sets, and questions whether a more open language should be adopted or whether this is applicable only in relation to specific types of artefact or specific periods or places. By exploring this evidence and questioning our interpretations we can build towards an archaeology of making.

02 TRACING COMMON LINKS IN THE ARTISANAL SKILLSET OF THE PRE-HISTORIC AND CONTEMPORARY CRAFTSPERSON

Author(s): Griffiths, Mark (University College Cork)

Presentation Format: Oral

Discovering convincing evidence of cross disciplinary craft practice by individual makers in prehistory is undoubtedly challenging. We can consider the context of finds and artefacts, similarity of design or 'signatures' of toolmarks and execution of the work. What insights into the artisanal skill set of prehistoric craftspeople might be observed in the context of the contemporary artist? As many of our traditional craft skills are being lost, professional makers find themselves challenged to master other trades which in the recent past would have been contracted out. Today's craftsperson constantly adapts to new processes, across a spectrum of materials, in order to create desirable, commercial works.

The Pallasboy Project has been investigating the processes and methods of the crafting of prehistoric wooden artefacts recovered from wetland contexts, drawing on collaborations between practicing professional artisans and archaeologists. In this paper we consider the problems and potentials of exploring the 'creative mind' of the original makers. This approach suggests that for certain wooden artefacts, design characteristics seem to echo the artistic flare of the Bronze and Iron-age metal worker. This paper will hopefully act to stimulate debate concerning how we can employ the experience of professional artisans through experimental archaeological approaches to reflect on interdisciplinary skills and practices in the past.

03 FIBRE, FABRIC, SKIN AND CERAMIC: INVESTIGATING CROSS-CRAFT IN THE EARLY BRONZE AGE

Author(s): Harris, Susanna (University of Glasgow) - Mould, Quita (Independent Scholar) - Cameron, Esther (Independent Scholar)

Presentation Format: Oral

In 2011 a stone burial cist was excavated on Dartmoor in Devon (UK) and found to contain a notable assemblage of items associated with the cremated remains of a young adult, radiocarbon dated to the Early Bronze Age c.1730-1600 cal BC. Unexpectedly, organic material was exceptionally well-preserved and included the remains of several unique items including a braided hair armband or bracelet, a decorative band of textile and animal skin, and a coiled basket made of plant fibre ornamented with hair. These objects demonstrate the use and understanding of different materials in the manufacture of single objects and provide an exclusive opportunity to explore the range of skills required to make fibre and skin products in the Early Bronze Age. For example, the textile and animal skin item combined a woven fabric, likely to be of nettle fibre, and a skin-based product, presumed to be a cured or semi(pseudo)-tanned calf skin. It reveals the techniques and proficiency of those who manufactured this object to process differing raw materials: plant fibre, skin and possibly also sinew. It demonstrates skills in handling the manufactured materials (textiles and skin products) with differing properties. However, while the raw source materials (skins, plant fibres, animal fibres, sinew) varied, the methods used to produce them may not have varied so greatly; including soaking, beating, scraping, and separating. Other grave goods show the use of similar techniques: the actions of aligning and stitching fibres and threads in the coiled basket and in the textile and leather band, or the decorative appearance of the organic objects in terms of Early to Middle Bronze Age ceramics. Depending on how we envision the making processes, this might imply that the techniques, and type of artefact produced rather than the materials employed, may have defined the specialist.

04 TWIST AND TURN: CROSS-CRAFT CONNECTIONS AND GESTURE IN IRON AGE BRITAIN

Author(s): Farley, Julia (British Museum)

Presentation Format: Oral

Archaeological approaches to material culture generally divide objects according to material, e.g. pottery, lithics, metalwork. Wood and textiles rarely survive in acidic northern European soils, and are studied primarily through scientific analysis of trace remains. Whilst these divisions allow specialists to develop in-depth knowledge of the properties and techniques associated with particular materials, they can also make it harder to look for connections between crafts.

This paper takes an alternative approach, focussing instead on the embodied experience of making, through an examination of the movements and gestures associated with various ways of processing materials.

For example, although archaeological textiles from prehistoric Britain rarely survive, adding twist to plant and animal fibres through the process of spinning would have been an essential everyday task in most households, producing the threads used in woven textiles. Ideas of 'twist' and 'circling' were also applied in other materials and practices. Metalworking, pottery, and house construction often seems to have drawn on a shared lexicon of craft processes: adding strength to materials by binding, twisting and turning in circles. Pots were coil-built, and houses and roofs constructed according to a circular 'roundhouse' model.

In some cases, similar movements and gestures would have been used to create the same effects across materials, but in other cases the physical experience of working with these objects would have been very different.

Can these similarities and differences in how effects are produced in various materials help to illuminate potential symbolic and practical interactions between crafts?

05 EXPERIMENTAL APPROACHES TO THE MAKING OF PREHISTORIC POTTERY

Author(s): Innes, Marta (University of Glasgow)

Presentation Format: Oral

Within the study of the Scottish Bronze Age pottery class of Food Vessels (2140-1620 BC), there has been little interest in the particularities of ceramic production and their interpretative impact, with most of the existing studies simply relying on a basic hylomorphic model of making to support their fundamentally typological objectives. This paper will propose an alternative craft-based approach to the analysis of Food Vessel pottery, employing aspects of experimental archaeology to explore the creative and technological processes of ceramic production from the involved perspective of a maker rather than a theoretical analyst. Through hands-on engagement with raw materials, handling of the clay to form reproduction pots and employing replica tools to decorate the vessels, this approach aims to recreate and trace the intimate relationship between the potter, the clay, and the pot, investigating the material basis and practice of the craft from the inner perspective of the making process. Shifting the focus from the finished product of the static pot to the active experience of the making, this approach intends to challenge existing theories with alternative ideas about production activities and craft skills. Concentrating on the active and morphogenetic qualities of raw materials, and the reciprocal character of the interaction between the various players engaged in the making process, this perspective allows for the exploration of both the role that non-human actants play in shaping the maker's actions, and the entangled material basis of all creative engagements - facilitating a proposal of an alternative archaeology of making.

06 CRAFT AS EMBODIED GAZE: CRAFTSMANSHIP IN LATE BRONZE AGE THEBES

Author(s): Dakouri-Hild, Anastasia (University of Virginia) - Demakopoulou, Katie (Director emerita, National Archaeological Museum, Athens)

Presentation Format: Oral

In this paper we examine the archaeological evidence from the Late Bronze Age palatial centre of Thebes, Boeotia, Greece. This site is not only famously involved in the hoarding of exotic imports for the purpose of local craftsmanship (e.g. 'oriental' cylinder seals and other similar objects). It provides some of the best evidence for the manufacture of prestige items in local workshops dispersed throughout the acropolis of Thebes, the Kadmeia and operating under palatial, monopolistic control. We explore similarities, continuities and contingencies across different types of materials engaged in these workshops, suggesting that workshops explored a variety of aesthetic, stylistic, and functional visions in complex and embodied ways, at the same time as craftspeople subscribed to routinized, apprenticed techniques of the body, established repertoires of 'prestige items' and elite demand. We propose that these workshops did not 'specialize' in certain types of materials or artifacts as would-be proto-industrial facilities, as has frequently been suggested. Rather, they appear to have operated as multimedia ateliers, in which ludic experimentation, visual variety and juxtaposition, combination of textures and materials, embodied engagement with the latter and their inherent properties (patterns, sheen, feel, etc.) was not only pursued but highly valued, establishing a distinct value for the products, in addition to the material value of individual components and materials used.

07 THE BIVALENT ROLE OF THE BRONZE AGE ARTISANS

Author(s): Wittenberger, Mihai (National History Museum of Transylvania)

Presentation Format: Oral

Last year we talked about the economically logical chain from mining to the end product and the link with power: administrative, religious, and military.

Herodotus said there was a time when the gods and people were living together, and this was "the golden age of mankind." Beyond ancient lyricism we must see how the Bronze Age society understood this Golden Age. In this chain an important role is played by artisans, be they metallurgists, potters or craftsmen in wood. Besides talent and technical knowledge, they were vessels of special knowledge. They understood the symbols they used on the material and more; they brought new elements from distant regions. This proves that they were moving far beyond the local community. Through their knowledge and skills, artisans have had a bivalent role in society: first, in creating prestigious products for those who were leading the society as a social signal of their power; and second, in relation to the divinities, where both the leaders and the community they represented were bad. The principle that any sacrifice should be in the likeness of divinity has made artisans the messengers of these messages.

Under these conditions, we must understand that craftsmen who produced prestigious pieces or pieces for divinities had a special status in the society of the Bronze Age. At the same time, one can notice a major difference between the pieces intended for leaders and divinities and those dedicated to domestic use.

08 MAKING THE FUTURE? EXPLORING THE CONTINGENT RELATIONS OF POTS AND SHERDS IN EURASIAN BRONZE AND IRON AGE SOCIAL ACTION

Author(s): Johnson, James (University of Copenhagen)

Presentation Format: Oral

Archaeological studies of pottery production usually prioritize whole or complete vessels either in form, reconstruction, or interpretation. As a result, the socio-technological relations between complete vessels and sherds, or sherds on their own, remain largely

under-explored, except as a denouement. Perhaps more importantly is that pottery (and its production) is considered either timeless and/or as complete, finished vessels that can be identified with socio-political subjectivities related to the control of labor and craft activities ("craft specialization"), and, ultimately, how these things are used by individuals. In this paper, I interrogate the intentionalities that go into pottery making, and how these intentionalities go into the imagining, or making, of a pot's futurity. Drawing upon two case studies, one from the Iron Age of west-central Europe and the other from the Late Bronze Age of the southern Urals of the present-day Russian Federation, I explore the lifecourses of ceramics from both time periods and regions by focusing on the afterlives of pots or what happens after they break or fragment. By doing so, I assess whether or not these future 'afterlives' were intentionally or accidentally 'made'. Focusing on how sherds are produced and the paste recipes that go into pottery, I illustrate the multi-temporal and relational nature of ceramics in Eurasian prehistory.

09 CROSS-CRAFTING FOR ATTENTIVE EYES

Author(s): Miller Bonney, Emily (California State University Fullerton)

Presentation Format: Oral

Evidence for appropriation of craft techniques by prehistoric artisans can be difficult to detect particularly for Early Bronze Age Crete. Archaeologists must rely primarily on pottery from tombs which may not be representative of the craft traditions of the early Cretan population. Focused on typologies we may miss tantalizing hints of a fluid artisanal culture. An example is the Fine Grey Ware pyxis. Because of the sophisticated technology involved in its production and relatively rarity in the archaeological record it has been treated primarily as an example of elite consumer good. But manufacture involved craft innovations other than the firing technology. The wiping or painting used to decorate the surface or earlier pottery was replaced by incision with artisans using a variety of tools not previously employed in Cretan pottery. Unlike the Neolithic incised wares on which a white filling frequently was employed to clarify the design the Fine Grey Ware patterns were not emphasized but demanded close attention.

These techniques also changed design principles from clearly visible motifs linked to vessel morphology to overall patterns that spread across the surface. A similar insistence on attentive looking is evident in Cretan seals which also relied on incision and similar design principles with engravers using . These similarities offer the intriguing possibility that crafters may have shared techniques to achieve particular visual effects.

500 OUTCAST ARCHITECTURE: UNUSUAL BUILDINGS AND UNUSUAL BUILDING

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Save, Sabrina (Amélie SARL) - Haue, Niels (Historical Museum of Northern Jutland)

Format: Regular session

From Scandinavia to Spain, Argentina to Japan, archaeologists the world over have been excavating more and more sites, revealing a multitude of different types of buildings and architectures. While most of these types seem abundant, well documented and well understood (a longhouse is a long house, a teepee a teepee - or are they?), new building types and architectures are still being discovered, while others already known remain enigmatic: their form is different, they seem to have a different concept of architecture, a different organization, or a different geographical location, placing them outside of the type. Even those we think we know can sometimes reveal hidden secrets. What makes these buildings different? How do we explain these differences? And how do we investigate these buildings? What new methods and theoretical approaches - an archaeology of the 21st century so to speak - can we bring to these unusual buildings and those buildings that are built differently?

In this session, we aim to untangle the unusual and ambiguous, the outcast architecture from the world over, from the most ancient to the most modern, by sharing and confronting our different points of view. Whether by using traditional archaeological methods or digital modeling, geochemistry or archaeobotany, single context recording or theorizing, it is by sharing and learning from others who have succeeded or failed in untangling their unusual buildings that we hope to make sense of our own 'outcasts'.

ABSTRACTS

01 EARLY-NEOLITHIC WOODEN STRUCTURES IN SOUTH-WESTERN EUROPE. ARCHAEOLOGICALLY BASED 3D RECONSTRUCTIONS AT LA DRAGA (BANYOLES, SPAIN)

Author(s): Lopez-Bulto, Oriol - Campana, Ivan (Universitat Autònoma de Barcelona)

Presentation Format: Oral

The archaeological site of La Draga (Banyoles, Spain) is an Early Neolithic site dated around 7000-7300 cal BP. What makes this site unique is that it is one of the earliest open-air settlements in the Iberian Peninsula and the only pile-dwelling settlement found so far in this region. Moreover, the majority of the site was waterlogged/submerged in water. Thanks to this condition, large quantities of perishable materials have been preserved, amongst which wooden elements were found. The archaeological missions found

thousands of these wooden elements and it was also possible to identify architectural elements among them. Thus, la Draga offers an excellent and unique opportunity to obtain new information about early Neolithic societies in the Iberian Peninsula and the related wooden architecture. In this paper we will present the results of the different analysis (dendrology, virtual reconstruction, and architectural analysis) carried on in order to understand these wooden structures for a region and a historical period where architectural studies are almost non-existent. In the analysis process of the wooden architectures, virtual reconstruction had been an essential part: combined with the other analysis it has allowed us to distinguish between those wooden parts with a clear (or almost clear) architectural function and those parts that had no evident structural function. This, together with all the other analysis, results in the first reliable model of one of the houses at la Draga.

02 ENIGMATIC LATE NEOLITHIC BUILDING AT LA VILLENEUVE-AU-CHATELOT, EASTERN FRANCE: A MULTIPROXI APPROACH TO UNDERSTANDING ITS SPATIAL ORGANISATION

Author(s): Save, Sabrina (Amélie SARL)

Presentation Format: Oral

During the last decade, several extensive excavations undertaken in the Seine valley in the area of La Villeneuve-au-Châtelot, revealed archaeological remains from a wide range of periods, including a mega palisaded enclosure potentially encircling an area of over 40 ha. A wooden palisade, partially preserved in a ditch with its wooden planks trapped by thousands of milling stone fragments (over 5 tons of milling stones have been gathered) is dated to the late neolithic. Few features are clearly associated with this enclosure, the exception being a strange and powerfully built building located near its centre. Three other buildings of this type have recently been discovered in the area. The main body of the building has a rectangular shape of 22m by 30m with an impressive and disproportionate funnel-shaped entrance of 20m long. The exterior 'walls' and the funnel-shaped entrance of the building are materialized by a deep and very narrow ditch, in some places clearly interrupted; while no evidence of posts was identified inside the ditch, it is most likely part of the buildings foundation. Inside the building three alignments of posts organize the space. These postholes are wide and deep, with fragments of milling stones used as post-packing like in the palisade. No hearth or other features bring evidence on the function or organization of the building; very few artefacts were recovered from the fill of the posts and ditches.

In order to investigate the function and organization of the building a multiproxi approach, including extensive geo-chemical mapping (pXRF), geophysical survey, micromorphology, theoretical modelling and an extensive sampling program to study all the ecofacts preserved was undertaken and are showing encouraging results.

03 AN UNEXPECTED COMPLEXITY FOR THE ARCHITECTURE OF EUROPEAN IRON AGE: THE BUILDINGS OF VALCAMONICA (ITALY)

Author(s): Pierre, Péfau (University of Toulouse Jean Jaurès)

Presentation Format: Oral

The Valcamonica rocks, in the Italian Alps, have provided hundreds of engravings dated mainly – where possible through stylistic analysis, study of the drawings stratigraphy and the typo-chronological dating of the objects engraved on the rocks – from the Iron Age. Some petroglyphs represent elevated constructions weird at first glance, by their shape and level of detail, and sometimes regarded as imaginary.

The architectural study of these engravings made by the Camunian people during the Iron Age highlights their remarkable structural coherence and provides precise information about the construction techniques then in use, contrasting completely with the buildings generally thought for the period. For example, these drawings make it possible to show the early existence of corbelled floors by means of the use of the triangulation technique – generally associated with Roman culture. The architectural features are nevertheless merged with many symbolic elements, in connection with the ambiguous house status within the Camunian beliefs. This particular relationship between the real and the symbolic therefore requires a rigorous analysis.

Although the very special case of the Valcamonica buildings cannot be applied to other geocultural spaces, their unexpected complexity contributes to renew our view of the protohistoric architecture of temperate Europe and its actors. The different interpretations will be put into perspective thanks to a set of archaeological, iconographic and ethnographic data.

04 ØKSENHEDE – A RELIGIOUS CENTRAL SITE IN NORTHERN JUTLAND OR AN UNUSUAL FARM?

Author(s): Haue, Niels (Historical Museum of Northern Jutland)

Presentation Format: Oral

In the northernmost parts of Jutland, Denmark, far away from the Roman Empire, an unusual settlement was excavated nearly 20 years ago at Øksenhede. The settlement dates to the late Pre-Roman Iron Age and the Early Roman Iron Age, and revealed several longhouses and a surrounding palisade. The site is interpreted as a chieftains farm, or rather a *fürstensitze*, with only a few parallels in the Danish area.

This paper will focus on a single farmstead placed to the south of the chieftain's farm. This farmstead comprise of a longhouse (House A) and a small outbuilding (Building C). A stone-filled ditch, which forms a bipartite yard measuring 16x24 meters, connects the two buildings. Building C is of modest size (9 x 5 meters) and even though the farm was recognized as an enigmatic feature, building C was finally described by the excavator as an outbuilding associated with a regular longhouse (20 x 5 meters) to the north

(building A).

The site remains enigmatic and with no comparable finds in Denmark. This paper will present an interpretation of the farm as a sanctuary with parallels to Gallo-Roman temples. This interpretation might seem controversial while so far, no religious buildings have been uncovered in an Iron Age context. Offerings to the gods were made in sacred bogs, where weapons, ceramic vessels and in rare cases humans were sacrificed. Øksenhede could be a religious site with a barbarian temple associated with a chieftain's farm.

05 THE TOWER OF TOFTUM NAES – AN OUTSTANDING BUILDING

Author(s): Terkildsen, Kamilla (Viborg Museum)

Presentation Format: Oral

In the middle of Jutland, Denmark the Museum of Viborg has been excavating a quit surprising site. It has many similarities with the well-known aristocratic sites from the late Iron Age and Viking Age (6th-11th century) at Lejre and Tissø with great hall-type buildings and an area of pit-houses - even though the buildings are somewhat smaller and the finds not quite as numerous. It is quite surprising to find such an aristocratic site in the north-western part of Denmark, as they have until now been exclusively found in east Denmark.

However, the most spectacular building at the site is a small, almost quadratic building, build in traditional Nordic style with a sturdy wall-trench, outer inclining supporting posts and an internal roof-bearing posts. However, the building is just 7.5 × 7.5 and the construction-details show that it must have been a high strongly build building and as such it can only be interpreted as a tower. The building is dated to the 8th century. Towers are not known at any other sites in South Scandinavia from this period, and the few known examples from northern Europe all seem to be part of earthen ramparts and such like. So where did the idea come from? What was the function? And how should the tower be understood relating to the aristocratic site?

06 THE ROMAN VILLA OF NOHEDA: A CASE STUDY OF ARROGANT ARCHIECTURE OF HADRIANIC INSPIRATION

Author(s): Valero Tévar, Miguel Ángel (Universidad de Castilla-La Mancha)

Presentation Format: Oral

In the villae and palaces of the Late Antique Period, the adventus of the dominus and his epifania before his clients, constitutes a genuine ceremony full of symbolism which is reflected in the architecture of the chambers where the act is held. A fundamental aspect of this display of power by the possessores are the new and grand edifices boasting lavish architecture, among which various chambers stand out, such as the reception hall –which is usually larger and shows a basilical floor plan-, and the triclinia which, during this period, tend to adopt the new triple apse floor plan. But the latter are by no means the only areas where architecture, ornamentation and luxury serve the purposes of the aristocratic elite.

One of the most significant examples of this type of majestic architecture used to further self-representation, is the Roman villa of Noheda (Cuenca, Spain). Latest research undertaken in the site has unearthed a most exceptional sculpture ensemble of more than 200 figures as well as a substantial peristyle around which a number of luxurious chambers are set. These are intentionally isolated in order to emphasise their presence within the ensemble of aedificia that make up the villa. Likewise, on the southern façade of the complex, there are a number of wide pools set in the shape of a cascade –in an optimal state of conservation- the object of which is the monumentalisation of the compound.

All these constructions are coupled with the triforum triclinium –where the famous figurative mosaic is found- and, together, they help us to better understand the planimetric layout of the villa, together with the technical and ornamental setting it boasted during its era of splendour and which is undoubtedly inspired in Hadrianic architecture.

07 THE CASE OF THE LATE ROMAN INSULA FROM MALOUTENA DISTRICT IN NEA PAPHOS (CYPRUS)

Author(s): Mikocka, Julia (University of Warsaw)

Presentation Format: Oral

The aim of my presentation is to consider the interpretation of the architectural plan and functions of the buildings in the late Roman insula from Nea Paphos.

The results of the excavation works carried out between 1982 and 2008 were analyzed. The new observation of the arrangement of the walls; floors; mosaics; paintings and the architectural decoration, conducted during the research seasons of 2014-2017, will be presented. The analysis of the analogies complementing the research will also be discussed.

In the late Roman insula, the so-called House of Aion and the North-Eastern House were excavated, but their interpretation is still uncertain. This insula was clearly distinguished from the other insulas, with the unusual features observed including the divisions in the insula running along the urban area rather than across it. In the House of Aion, a complex of rooms decorated with mosaics, which were accessible from the street; a room where the benches and wall paintings of high quality were discovered; a complex of rooms with a likely wooden floor, which does not occur often in the architecture of this region, are all worth mentioning. The location of this insula in a representative part of the city, in the immediate vicinity of the residence of an official, is also noteworthy.

This research brings new data on the functions of buildings in the late Roman insula. To date, only limited information on the insulas with the residential and public buildings from the area of Cyprus has been published. The present study also provides information on

the history of Nea Paphos during the late Roman period and sheds light on the social, administrative and economical changes that took place in Nea Paphos during this period.

08 “MIXED” ARCHITECTURE : THE CASE OF FONTVIEILLE NECROPOLIS (BOUCHE-DU-RHÔNE, FRANCE) AND THE MEDITERRANEAN STRUCTURES BUILT UNDERGROUND AND IN ELEVATION

Author(s): Porqueddu, Marie-Elise (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence; Università di Sassari)

Presentation Format: Oral

The Fontvieille necropolis, in South of France, is famous for being a monumental and “outcast” rock-cut tombs complex from the end of the Neolithic. Known and excavated since the nineteenth century, it has four hypogea and a dolmen. One of these hypogea, the Grotte des Fées, is, by its dimensions, the largest underground cavity excavated in the western Mediterranean. The peculiarity of these structures lies in the fact that their architecture is both excavated but built in elevation. Indeed, they have a several meters deep lower part and an upper part built with megalithic slabs whose weight exceeds several tons. The cavity and the slabs are then covered with a cairn. These architectural peculiarities make this necropolis a unique case for the period and the region. Within our doctoral work, we proposed to study the complete operative sequence of these architectures, from the choice of the place of their implantation to the techniques and strategies deployed during the digging of the cavity and finally the setting up of the slabs and the cairn. Other rock-cut tombs present in the western Mediterranean at the end of Prehistory also have elements in elevation, which can be megalithic or not. However, we note that architectural solutions are diverse and have multiple variations. The necropolis of Fontvieille remains unique in both its size and its architectural concept. The study of these funerary architectures allows to question the ambiguous status of these structures through the different strategies and techniques related to their implementation.

09 ‘OPUS SPICATUM’-PATTERN AND MASONRY TECHNICS OF NORTHERN BLACK SEA REGION: WHEN UNUSUAL BECOMES USUAL

Author(s): Oleynik, Tatiana (Institute of Archaeology of the Russian Academy of Sciences)

Presentation Format: Oral

This unusual masonry technique was known in Byblos in 4000 BC, in the ancient Mesopotamia in 3000 BC, Troy, the British Isles and Sicily. Later, it was actively used in the Roman Empire, where it received its present name, ‘opus spicatum’. That was where the Byzantine Empire has inherited it from.

Since in the ancient time, this technique was almost unknown in the Northern Pontic region, there are different opinions as to where this technique came here from in the medieval times and when. One of these points of view attribute it to the Khazar Khaganate which wielded power over these territories. There is also an opinion, according to which, ‘opus spicatum’ has anti-seismic properties. By the way, the Khazars used it in the construction of the building’s base, usually erecting walls from raw brick.

Another version – concerning the Byzantine origin – looks more probable, because ‘opus spicatum’ was indeed popular in the Byzantine Empire, both in the capital and in provinces. The use of brick ‘ornaments’ was inherited from the Romans, but only in Byzantine Empire it became a self-dominating decorative element of the building’s exterior. It was noted that besides the constructive origin, the masonry also possessed a decorative one, thanks to various ornaments on the façade. Therefore, the technique involving a combination of various laying methods was actively used to decorate the building’s exterior. In medieval Crimea, it was perhaps one of the most popular techniques in various sectors of construction, especially in civil construction.

However, the history of ‘opus spicatum’ did not end with the fall of Byzantium. Apparently, it has proved itself so well, in terms of both technical and decorative qualities, that it has survived more than its share of empires, and still can be found in various regions of Europe and Asia.

10 THE ASYLUM AND THE GARDEN CITY: UTOPIAN SUBURBAN MODELS IN THE DESIGN OF SCOTTISH INSTITUTIONS FOR THE INSANE

Author(s): Allmond, Gill (Queen’s University, Belfast)

Presentation Format: Oral

The historiography of the asylum has usually been dominated by the claim that late nineteenth and early twentieth century institutions for the insane represented the victory of therapeutic pessimism with asylums increasingly being used as ‘warehouses’ to sequester society’s unwanted, within an ideological climate that often presented the insane as indicators of degenerative social decline. This poster will question this assumption, using the spatial and material evidence of early twentieth century asylums in Scotland. These asylums, built on a village model in contrast to English asylums of the period, were inspired by several prevalent socio-cultural movements, such as the sanitarian movement in public health, the domestic revival in architecture, the garden city in planning and the labour colony in social engineering. This poster will examine how these currents came together in a style of asylum construction that was adopted in Scotland, but largely rejected for general asylums in England. This development may be viewed as illustrative of asylum culture north of the border, where there was a particularly strong emphasis on freedom and individuality when compared with England at this period. The presentation will consider the complexity of asylum environments in terms of both their intentional effects and those that betray attitudes to the insane poor that were prevalent both within the asylum movement and more widely.

a. WORKSHOP OR WASTE-PIT? THE CASE-STUDY OF UNTYPICAL FEATURE FROM YOUNGER ROMAN PERIOD FROM BESSÓW (MAŁOPOLSKA PROVINCE, POLAND)

Author(s): Okonska, Magdalena (Institute of Archaeology Jagiellonian University)

Presentation Format: Poster

The most common features connected with wheel-made pottery production in Przeworsk culture are pottery kilns, while others, like workshops or dryers are recognized less frequently. It is also not unusual situation when because of rarity of those features their exploration leaves a lot to be desired. Moreover in the case of the excavations conducted in the past, like in this example, we do not have the opportunity to make additional analysis. This situation makes it more difficult to interpret a function of those puzzling features.

The example of such a unique feature was found in Bessów. An irregular construction arrangement, unclear function and untypical fill was main characteristics of it. In older publications it was defined as a pottery depot, and was interpreted as a place where unfired vessels were dried, or where ready-made vessels were stored. The basis for this interpretation was mainly the presence of huge amount of pieces of pottery discovered in the fill and in closest vicinity of feature (about 8330 sherds), with relatively low share of materials bearing traces of different types of damage at the same time. Re-analysis of pottery material, stratigraphy and preserved relic of construction elements allowed a new interpretation of depot as a presumably potter's workspace or part of a workshop.

This poster aim is to present the case study of the unusual archaeological feature, the process and difficulties of its re-interpretation, based on traditional archaeological methods.

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STORAGE STRUCTURES AND STORAGE GOODS FROM THE NEOLITHIC TO THE IRON AGE: ARCHAEOLOGICAL, ARCHAEOBOTANICAL AND ETHNOGRAPHIC PERSPECTIVES

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Tereso, João (CIBIO - Research Center In Biodiversity and Genetic Resources/University of Porto; InBIO - Research Network in Biodiversity and Evolutionary Biology (Associated Laboratory); Centre for Archaeology. UNIARQ. School of Arts and Humanities. University of Lisbon) - Alonso, Natàlia (University of Lleida) - Prats, Georgina (Integrative prähistorische und naturwissenschaftliche Archäologie - IPNA; University of Lleida)

Format: Regular session

Storage practices are a crucial part of subsistence strategies of many human communities. As such, facilities used for storing unprocessed or processed food and beverages have been found in different geographic and chronological contexts, among societies with different cultures and economic strategies. Whether dealing with hunter-gatherers or agricultural societies with diverse levels of complexity, storage has been a key-subject in many archaeological investigations.

This session will gather different perspectives on storage practices, from archaeological, archaeobotanical and ethnographic points of view, addressing 1) technical issues related to storage facilities, 2) the characterization of storage goods and storage practices and 3) the social aspects related to storage.

What types of storage facilities can we find in the archaeological record and how were they built and maintained? Which goods were stored? Were there particular facilities for particular goods? How were these goods processed before storage? How to detect long-term and short-term storage, household and communal storage? Who managed storage facilities and the access to stored goods? Which were the social implications of managing stored goods?

These are some of the questions we intend to address in this session. Presentations may focus on archaeological contexts from the Neolithic to the Iron Age or present day ethnographic studies which may help understand archaeological realities.

ABSTRACTS

01 IMPERIAL STORIES AND EMPIRICAL EVIDENCE: THE 'ENSILAGE RATIONNEL DES GRAINS' AND THE FRUITS OF CIVILIZATION

Author(s): González Vázquez, Mateo (Universitat de Barcelona)

Presentation Format: Oral

Even though today it is known that storage in pits -also broadly known as silos- had been widely used in mainland Europe throughout the Neolithic, Iron Age, and the Middle Ages, it later became almost totally forgotten. For this reason, it is not until the seventeenth century and beyond when some travellers, scholars, and ethnographers came into contact with North Africa that this method of food preservation was rediscovered in France and in Europe more generally. One of the most influential are the experiments carried out by Louis-Michel-François Doyère in the 1850s and '60s, driven by the necessity of the French administration in Algeria to produce a sound method for storing grain underground. This rationalised undertaking required an adaptation of the Algerians' storage

practices to the advances of science and technology, what Doyère categorized in 1863 as the *ensilage rationnel des grains*, what should be recognized as part of a 'cultural project of control' intimately linked to colonialism. In fact, this improvement was grounded on the idea, already transmitted by the Roman agronomists, that the effectiveness of subterranean storage in certain areas was due to its particular soil and climate conditions. In this paper, I shall explore how this long-standing colonial legacy, ancient and modern, has framed some of our own conceptions of subterranean storage and the focus of most archaeological enquiries, which have centred their interests upon the airtight conditions of storage in pits, their lining materials, and more generally the physical properties of the grain stored in them. Finally, I shall argue that what was styled by François Sigaut in 1979 as the 'rediscovery' of a storage method in Algeria, should instead be regarded as a reformulation of its meaning purpose.

02 INTRAMURAL, EXTRAMURAL, AND REMOTE STORAGE PROVIDE CONVENIENCE AND MITIGATE RISK: THE BOTANIC RECORD OF CULTIVATED, ENCOURAGED, AND WILD PLANTS

Author(s): Scott Cummings, Linda - Kovacik, Peter (PaleoResearch Institute)

Presentation Format: Oral

Storage practices for agriculturalists in the American Southwest and neighboring areas include both intra-mural and extra-mural storage within residential complexes or villages and remote storage. Storage strategies appear to transcend geographic or cultural regions.

Storage observed inside houses or residential complexes may be inside individual residences or in contiguous rooms. Interior storage strategies for larger houses involve pits, cists, bins, and hanging plants from the ceilings. These strategies for in-house storage dedicated floor space to construction of storage units (bins) at floor level and on banques or ledges, and storage in pits or cists beneath the floor. Neighboring bins in a single house contained a wide variety of cultivated grains, dried beans, squash, encouraged plants, wild plants, and plants important in ceremonies (tobacco). In this case, residents of this house enjoyed the convenience of having goods close at hand, but risked losing their stored goods in case of a raid.

Dedicating small rooms for storage in an apartment complex provided individuals, families, and larger groups with access to the stored goods. This type of storage suggests trust among neighbors and offers some protection from outside raiders.

In-house and within community storage is contrasted with isolated granaries that appear to have been used primarily to store grain (*Zea mays*) in protected locations, often on cliff faces with difficult access. These isolated granaries probably represent attempts to store communal resources away from living areas to protect them from outsiders. Resources allocated to these protected granaries are staples necessary to sustain a population during lean times rather than daily foods and condiments. Houses in areas containing off-site granaries also contain storage facilities, but it is not the only storage strategy for these residents.

03 DISTINGUISHING WILD FOODS AT THE TRANSITION TO AGRICULTURE IN SOUTHWEST ASIA: A NEW ARCHAEOBOTANICAL APPROACH

Author(s): Wallace, Michael (University of Sheffield, Department of Archaeology) - Livarda, Alexandra (University of Nottingham, Department of Classics and Archaeology) - Stillman, Eleanor (University of Sheffield, School of Mathematics and Statistics) - Jones, Glynis (University of Sheffield, Department of Archaeology)

Presentation Format: Oral

The transition to agriculture represented a major economic re-adjustment as communities shifted away from gathered wild plant foods to a reliance on cultivated domesticated crops. To understand this re-adjustment it is necessary to look at both the increase in crop use and the [perceived] decrease in wild plant foods. The latter of these requires a means by which to distinguish wild plants that arrived on sites as food from those that arrived by other routes.

To recognise wild food plants we sought to identify the remains of acts of storage and processing in the archaeobotanical record. These acts are those most likely to be associated with wild plant foods rather than other deliberate and incidental routes of deposition. We devised a new approach to the analysis of the archaeobotanical record based on the richness and purity of samples, which we applied to a database of archaeobotanical samples covering published, and many unpublished, archaeobotanical records for southwest Asia at the transition to agriculture. Findings were then cross-referenced with contextual evidence and ethnographic accounts to identify the suite of wild plants used as food by pre- and early agricultural communities.

Our new, robust approach to the question of wild food use reveals that with the adoption of agriculture there was no radical abandonment of wild plant foods, suggesting these resources remained of importance to subsistence despite the availability of domesticated crops.

04 STORAGE IN THE CENTRAL EUROPEAN NEOLITHIC: A VIEW FROM THE AMERICAN SOUTHWEST

Author(s): Rocek, Thomas (Department of Anthropology, University of Delaware)

Presentation Format: Oral

While substantial investment in storage is by no means restricted to agricultural groups, expanded investment in storage facilities, as well as shifts in the nature and organization of storage are virtually universal characteristics of the period of adoption of agriculture, whether the "Neolithic" in the Old World or the "Formative" (or in some cases the late "Archaic") in the New World. The specific features of this increased emphasis on storage are highly variable between regions and shift through time within them, but

underlying this diversity are broadly shared causal factors with implications for patterns of cultural adaptation. This paper takes a comparative approach. It examines the dimensions of technological, ecological, and social variation identified in interpretations of storage diversity through time and space in early agricultural communities in the United States Southwest, and considers potential implications of similarities and differences in the early to middle Neolithic settlements of Central Europe. Particular emphasis is placed on contrasting strategies of intra- and extramural storage, as well as on underground versus surface features. Variation in the abundance, form, and size of pits and internal partitioned space suggests contrasting trends in which most early agricultural settlements in the Southwest initially emphasized extramural underground storage and gradually shifted to increasing reliance on intramural (and private) space, whereas early Central European patterns appear more diverse and at least in some cases hint at a reverse trend of increasing storage diversity and more pit storage over time. This comparison implies that despite shared technological, social, and ecological factors, contrasts in developmental trajectories are notable and help to highlight likely adaptive trends in the two regions.

05 PHENOMENON OF GRAIN PITS AS UNDERGROUND GRANARIES IN PREHISTORY OF SLOVAKIA

Author(s): Gašpar, Adam (Department of Archaeology and Museology, Faculty of Arts, Masaryk University; ERASMUS MUNDUS - HERCULES Laboratory, University of Evora)

Presentation Format: Oral

Grain pits with specific shape features, such as the characteristic narrow mouth, were used for storage of grain in various periods and regions. A pit fulfilling such a criterion was after a thorough sealing suitable for a long-term storage of grain because the grains natural usage of oxygen created hermetically closed atmosphere with carbon dioxide. For mapping and recognition of different morphological shapes of the grain pits in time and space, a database was collected from the south west Slovakia. Closely watched are positions of grain pits in settlement areas, the problem of longevity of grain pits, their secondary functions as well as their decay and importance in community. Apart from grain pits, other possibilities of grain storage in Prehistory are outlined. Collected dataset is criticised and confronted with ethnographic findings and other studies on the topic of grain pits and storage.

Based on the collected data, a continuous presence of grain pits can be predicted from the end of Linear Pottery culture till the end of Chalcolithic Age. They have also been documented from the second half of Early Bronze Age till the end of Hallstatt Age. Distributions and number of grain pits in settlement areas varied. From the analysis of formative processes, it can be deduced that the archaeologically documented shape (type) of grain pit is in many cases altered by destruction of object after the end of its use as a grain pit. Despite possible mistakes in exact type classification we can safely state that during Prehistory the most prevalent type of grain pit in observed area were objects with straight bottom and walls converging to stenotic opening.

06 MANAGEMENT OF WATER AND FOOD SUPPLIES IN NEOLITHIC CAVES AND LOWLAND SUBSTRUCTURES OF THE SOUTH OF FRANCE: A USE-WEAR STUDY

Author(s): Debels, Pauline (Paul Valéry Montpellier 3 University; UMR 5140 ASM; UMR 8215 Trajectoires)

Presentation Format: Oral

The aim is to better understand subsistence economy between 3600 and 2300 BP, in the lowland and karstic plateaus of the south of France.

During this period, the Neolithics established new settlements in the karstic plateaus, where water can only be found in underground networks. To sustain their settlement, they had to design high capacity potteries and place them inside caves to collect percolation water even in dire seasons. However, recent works show that nearby settlements conveniently used those cavities in order to store their long-term food and fermented beverages stock as well. Two types of settlements can be found in the plateaus: ordinary households and groups of houses whose sole function was to transform alimentary goods for storing purposes. Hypothetically, users of the latter may have come from the lowlands where vegetal food is less available in autumn and winter.

No natural cavities can be found in the alluvial and littoral lowlands, as a result, the Neolithics have resolved to build underground cellars and pits that contain one or more high capacity pots. There is yet need to define if those goods were specific to the area or brought from the collection sites in the plateaus.

These preliminary results were achieved by using an innovative method of observation of macro-traces. The use-wear study of the potteries has already allowed the identification of some contents by using a referential of experimental traces and by using organic chemistry.

The main focus of this communication is to understand transformation processes using potteries that lead to storage in large ceramic containers inside caves or man-made structures. Use wear study can help answer questions such as who collected food, for whom? What are the techniques used to conserve perishables during the Neolithic? What did the Neolithics eat during winter time?

07 MINIATURE BOTTLES, PRESTIGIOUS CONTAINERS FOR PRESTIGIOUS GOODS AT THE BEGINNING OF THE COPPER AGE IN THE SOUTHEASTERN ALPINE REGION

Author(s): Kramberger, Bine (Institute for the Protection of Cultural Heritage of Slovenia - ZVKDS, Centre for Preventive Archaeology - CPA) - Berthold, Christoph (Competence Center Archaeometry - Baden-Wuerttemberg - CCA-BW, Eberhard Karls Universität Tübingen) - Spiteri, Cynthianne (Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters, Eberhard Karls Universität Tübingen)

Presentation Format: Oral

The real beginning of the Copper Age in the Southeastern Alpine region and the Western Pannonia is characterised by new material culture, in Western Hungary called Balaton-Lasinja Culture, in Southern Austria Kanizianberg-Lasinja, and in Northern Croatia and Continental Slovenia simply Lasinja Culture. Archaeological research showed that pottery of this culture presents connections mainly with the late Vinča Culture, which attests the earliest copper mining and copper smelting activities in Europe, and to the subsequent Salcuta-Krivodol Culture of the Central Balkan. One particular find that shows connections to the Vinča Culture are miniature bottles. Although they are not common, their findspots are distributed almost entirely in the Southeastern Alpine region. Their particular shape suggests that they were used for storing small quantities of goods, while their small, perforated handles indicate that they were hung with rope around the neck or behind the waist of selected members of society. This paper discusses the use and the importance of this particular find dating to the Eneolithic period in the Southeastern Alpine region. Different approaches were applied to attempt to discern their function, including detailed analysis of their archaeological contexts, typological analysis and comparative studies with ethnographic parallels. Biomolecular techniques were applied to test organic residues absorbed within the ceramic matrix, or deposited within the vessels. Nondestructive, local, highly resolved X-ray microdiffraction (μ -XRD2) and micro-X-ray fluorescence (μ -XRF) were also carried out on the bottle content.

08 INTERPRETATIVE TRAJECTORIES TOWARDS THE UNDERSTANDING OF NEGATIVE FEATURES USING TERRAÇO DAS LARANJEIRAS BRONZE AGE SITE AS A CASE-STUDY

Author(s): Jesus, Ana (Faculdade de Ciências, Universidade do Porto; Integrative Prehistory and Archaeological Science, University of Basel) - Tereso, João (InBIO - Rede de Investigação em Biodiversidade e Biologia Evolutiva, Laboratório Associado; CIBIO - Centro de Investigação em Biodiversidade e Recursos Genéticos, Universidade do Porto; UNIARQ - Centro de Arqueologia da Universidade de Lisboa; Museu de História Natural e da Ciência da Universidade do Porto) - Gaspar, Rita (Museu de História Natural e da Ciência da Universidade do Porto; GEPN-AAT / Grupo de Estudos para a Prehistoria do Noroeste Ibérico-Arqueologia; InBIO - Rede de Investigação em Biodiversidade e Biologia Evolutiva, Laboratório Associado; CIBIO - Centro de Investigação em Biodiversidade e Recursos Genéticos, Universidade do Porto)

Presentation Format: Oral

During prehistory, the most common features identified by archaeologists are negative ones, such as silo, postholes, hearths, sunken hut among others. Although interpretations are not easy to make some researchers prefer not to reflect upon them, classifying them as rubbish pits while other researchers argue these structures have specific functions.

This paper describes and discusses critically different types of negative structures and how archaeobotanical studies can guide the final interpretations. In order to exemplify this problem results from the Terraço Laranjeiras will be discussed. This Middle Bronze age site is located in the Sabor Valley (Portugal) where different types of negative features are the only archaeological evidence of human occupation. Some of those features were interpreted as storage pits and the plant remains as the result of such activities. However, the archaeobotanical analyses compared with ethnographic examples led to a different interpretation.

The results from this research show that the presence of wild species is higher than the cultivated ones and that the majority of the plant remains are chaff and weed seeds instead of cereal grains. To conclude, the carpological remains - abundance of fragments of chaff and weeds - are probably by-products from an early cereal processing stage (e.g. threshing). These findings suggest that the site is a place of processing cereal and not necessarily of storing it.

09 PITHOI AND STORAGE IN LATE BRONZE AGE SOUTHERN ITALY

Author(s): Porta, Francesca (La Sapienza-Università di Roma; Ghent University) - Mazza, Michele (La Sapienza-Università di Roma)

Presentation Format: Oral

Since the Italian Recent Bronze Age (XIII-XII century BC) in the indigenous contexts of Southern Italy a new ware appeared, the wheel-made pithoi produced with levigated clay. This production starts after the contacts with the Aegean world and is part of the very important technological transfer of the potter's wheel technique, between the eastern and central Mediterranean.

However, the importance of this pottery class, used to store huge amounts of goods, lies in its socio-economic implications. Starting from an accurate evaluation of published and unpublished evidence from Broglio di Trebisacce (Cosenza, Calabria) and its comparison with data retrieved in other contemporary contexts (e.g. Roca Vecchia -Lecce, Apulia-, Toppo Daguzzo -Potenza, Basilicata-) this paper will focus, in particular, on the detailed study of the characteristics of pithoi, storage facilities, and their inner features. At least from the Italian Final Bronze Age (XII-X century BC), indeed, it is possible to identify some areas used to collect goods, probably exceeding the domestic needs and interpreted as small-scale storehouses. This evidence will be combined with some analyses of organic residues from Broglio di Trebisacce and wider paleo-botanical data. All these elements, taken together, provide a better understanding of domestic versus supra-domestic storage and allow to develop hypotheses about the existence of some kind of

redistributive practices within at least some of the communities concerned.

The final aim of the paper is to gain a deeper insight into the management of resources in Late Bronze Age Southern Italy and to explore its implications in the socio-economic frame of the indigenous communities.

10 THE STORAGE OF PULSES DURING THE BRONZE AND IRON AGES: LOOKING AT ARCHAEOLOGICAL DATA THROUGH THE LENS OF ETHNOGRAPHY

Author(s): Prats, Georgina (Integrative Prehistory and Archaeological Science - IPNA/IPAS, Dept. of Environmental Sciences, University of Basel; Grup d'Investigació Prehistòrica, Departament d'Història, Facultat de Lletres, Universitat de Lleida) - Tarongi, Miguel - Alonso, Natàlia (Grup d'Investigació Prehistòrica, Departament d'Història, Facultat de Lletres, Universitat de Lleida)

Presentation Format: Oral

Cereal storage is a subject that has been largely studied in the archaeological literature while the question of the storage of other agricultural products such as pulses has not received the same attention. Ethnographic studies, by contrast, offer data regarding various systems of pulse storage. Yet finds of pulse seeds in the archaeobotanical record are few, a fact that does not appear to line up with that of ethnographic information where legumes play an important role. The fact that archaeobotanical remains are usually carbonised could explain their lesser representation. However, there are exceptions often linked to features of storage, comprising concentrations of legume remains. The difference of representation between legumes and cereals is therefore most likely related to differences in their means of processing for consumption.

The detailed study of the different agricultural processes such as storage or food processing can potentially offer a better interpretation of the role of legumes in Protohistory. This paper presents a study of the different ethnographic pulse storage features and compares a series of archaeological storage structures (related or not to pulses) throughout the Western Mediterranean to ethnographic data with the objective to offer interpretations as to potential means of pulse storage systems. This presentation also serves as a wider approach to the role of pulses in the agriculture and foodstuffs of societies of the second and first millennium BC.

11 SILO STORAGE DURING THE BRONZE AND IRON AGES: AN APPROACH TO DIFFERENT REALITIES IN THE NE OF THE IBERIAN PENINSULA

Author(s): Prats, Georgina (Integrative Prehistory and Archaeological Science - IPNA/IPAS, Dept. of Environmental Sciences, University of Basel; Grup d'Investigació Prehistòrica, Departament d'Història, Facultat de Lletres, Universitat de Lleida)

Presentation Format: Oral

Food preservation, at least until the next harvest, is fundamental to ancient societies with seasonal agricultural economies. The aim of this paper is to analyse the silo storage practices of settlements of the Late Bronze Age and Early Iron Age in the north-east of the Iberian Peninsula. The reality of silo storage during these periods is quite diverse as storage saw different realities depending on the region they are found. Furthermore, the aspect of storage capacity, a feature essential to this subject, underwent important changes. The analysis specifically identifies, describes and compares a number of silos from each chronological period. The wide range of collected information from the silos has enabled an analysis of variables such as the morphology, the capacity, the substrates and their distribution on settlements and in the studied territory. In addition, the chronological framework allows identification of the changes that took place in silo storage from a diachronic perspective.

Storage of agricultural products is key to understanding social and economic aspects of ancient communities. For this reason this study also focuses on the role of storage not only along agricultural models, but with those linked to livestock. The current study also explores the existing theories about storage, social and territorial organisation. The results offer significant progress in the understanding of notions not only of storage, but of the agricultural and productive practices of communities of the Late Bronze Age and Early Iron Age.

12 IRON AGE STORAGE SYSTEMS AND HOUSEHOLD ECONOMIES IN THE LOWER EBRO RIVER REGION

Author(s): Jornet, Rafael (University of Barcelona; Món Iber Rocs SL)

Presentation Format: Oral

The social and political complexity indexes developed by the different Iron Age communities that conformed the Northern Iberian Culture are not the same. Unlike the centralised settlement structure documented at the Catalan coast, in Lower Ebro river region there is no evidence of the existence of major, first-order towns, nor, on the other hand, of a dense network of small rural settlements scattered across the countryside. There is nothing similar to sites where large quantities of cereal surpluses were stored, indicating control over production. On the contrary, archaeological documentation testifies to areas of storage in height (La Moleta del Remei), basements (Coll del Moro) and cellars (Sant Antoni). Although these seem to be domestic structures, they far exceeding strictly family necessities.

The aforementioned settlements would be subject to an elite control which dominates the production – or means of production – although family groups have a key role to play since a significant part of the production is developed within the household and family contexts. Craft activities – such as milling, textile manufacturing or possibly vinification for instance – are documented inside some of the houses where the elite resided. This accumulation of work inside certain buildings response to the dominant groups willingness of generate excedents to lay down the filiation tie with the dependent families, as well as to guarantee management and

control of the whole technological process towards external commercialization.

We believe that this model is natural for a certain social organization such as chiefdom, in other words one of the first types of organization what in general anthropologists call regional polities.

13 THE SERRAT DELS ESPINYERS (ISONA I CONCA DELLÀ, LLEIDA, CATALONIA), A LONG-TERM STORAGE SITE IN THE PYRENEES

Author(s): Garcés Estallo, Ignasi (University of Barcelona) - Belmonte Santiesteban, Cristina - Bermúdez, Xavier (IPAT-Cultural services) - Reyes Bellmunt, Teresa (Independent research)

Presentation Format: Oral

At the foot of the Pyrenees, in a rural environment, the Serrat dels Espinyers site shows a long-term activity related to the storage of grain. There were several silos from the Neolithic period, an extensive field of silos from late Iberian period and a horreum from the Roman imperial period.

The remains show the role this site had over time as the centralizer of the agricultural production of this area, despite being associated with very changing power centres: initially, to the Iberian city of Esó, later, a Roman military camp and, finally, the Roman city of Aeso.

The data recovered is key to understanding the agricultural exploitation in the territory and changes in storage systems, going from granaries in confined atmospheres to granaries built in controlled atmospheres. Beyond grain storage, the reuse of deteriorated silos to deposit in different materials has also provided information about specialization in livestock farming, and it is a singular case as regards the use of animals, equines and dogs on the breeding of cargo and ritual activities related to both domestic and funerary spaces.

We would like to argue that the results of our analysis of silos suggest the existence of a large population and a hierarchical society in late Iberian and Roman Imperial periods, and these findings enhance our knowledge of silo fields and their function in an inland area. The Serrat dels Espinyers site provides essential knowledge to understand the many aspects of human settlement in this sector of the Pyrenees.

14 THE STORAGE OF SURPLUS IN IRON AGE IBERIA: THE GRANARY AS PART OF AN INSTITUTION

Author(s): Vives-Ferrandiz, Jaime (SIP-Museu de Prehistòria de València) - Pérez Jordà, Guillem (Instituto de Historia CCHS-CSIC) - Albir Herrero, Cristina - Tortajada Comeche, Guillermo (SIP-Museu de Prehistòria de València)

Presentation Format: Oral

In this paper we will deal with the social implications of centralized storage practices as applied to a case-study in Iron Age eastern Iberia. This period is characterized by complex organizational systems and social hierarchy. Political entities were dominated by the so-called oppidum, a walled settlement inhabited by people controlling resources and long-distance trade. The role played by empowered individuals and households in organizing and structuring production have traditionally been stressed. However, less attention has been given to other social structures and institutions in organizing production. Granaries, we contend, are part and parcel of such institutions.

The detailed architectural and contextual analyses of the 4th century BC settlement of La Bastida de les Alcusses (Moixent, Valencia), has revealed the existence of a collective storage building in which items for the administration of surplus, tools for farming and facilities for milling and baking and devices for the distribution of beverages have been recorded. This evidence suggests that this building was not merely intended for storage but it was part of an institution that controlled and mobilized resources and labour. Comparison with other storage structures in the area will reveal differences in terms of the scale of stored surplus with major social implications for the historical developments throughout the Iron Age.

15 STORAGE OF GRAINS IN NW IBERIA DURING THE IRON AGE: STRUCTURES, CROPS AND SOCIETIES

Author(s): Tereso, João (CIBIO - Research Center in Biodiversity and Genetic Resources, Univ. of Porto; InBIO - Research Network in Biodiversity and Evolutionary Biology, Associate Laboratory; Natural History and Science Museum of the University of Porto; Uniarq - Centro de Arqueologia da Universidade de Lisboa) - Seabra, Luís (CIBIO - Research Center in Biodiversity and Genetic Resources, Univ. of Porto; InBIO - Research Network in Biodiversity and Evolutionary Biology, Associate Laboratory)

Presentation Format: Oral

The Iron Age was a time of increasing complexity in NW Iberia. Changes in settlement structure were accompanied by a diversity of strategies to store crops and wild fruits. These included the traditional underground storage pits and above-ground facilities, such as wattle and daub structures, large vessels and, by the time of the earlier Roman contacts, horrea. Storage seems to have taken place at different social contexts, since alongside household structures, we find sites with large areas exclusively used for storage. In some cases, these areas were protected by monumental structures.

Here we will make an overview of Iron Age storage facilities in NW Iberia focusing on the crops that were stored, the way they were processed before storage and the social and economic implications these facilities would have had for the human communities that relied on them. Main crops in NW Iberian Iron Age were hulled and free-threshing wheat, hulled barley and broomcorn millet. These showed significant agronomic complementarity that suited the region's geomorphology and climate. At the same time, these

species demanded different post-harvest processing (e.g. dehusking, winnowing, sieving) which may have had implications at the storage level and, subsequently, on the daily life of Iron Age communities.

Differences in crop preferences and storage at regional level were recently detected and need clarification. Cultural, economic and environmental hypothesis will be discussed by joining archaeological, ethnographic and archaeobotanical data.

502

EARTHEN ARCHITECTURE AND HABITATION SITES: BUILDING WAYS OF LIFE IN PREHISTORY

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Molist, Miquel (Autonomous University of Barcelona) - Gómez, Magdalena (IPHES) - Mateu, Marta (University of Barcelona) - Gómez Bach, Anna (Autonomous University of Barcelona) - Belarte, Carme (ICAC) - Wattez, Julia (INRAP; UMR 5140 ASM) - Jallot, Luc (University of Montpellier)

Format: Regular session

Research on prehistoric architecture has a long tradition as mean of approaching socioeconomic and cultural aspects of human communities. Framed in this context, prehistoric earthen architecture has emerged as a relevant topic in the last decade not only to empirically analyse the material remains founded in the archaeological record, but as fundamental data to reconstruct the use of the space in prehistoric ways of life. This session is a part of Réseau Terre activities, Group working on earthen architecture.

This session is intended to be an international forum to bring together results presentation, discussion and analytical programs on individuals case studies or regional synthesis, related to earthen architecture during late Prehistory in a broad sense of the term (Neolithic to Iron age). Geographically and culturally, the session is open to all researchers working on different regions such as those of the Mediterranean areas (East Mediterranean, Western Mediterranean) as well as continental Europe. It is expected that in addition to descriptive architectural analysis, other methodological approaches such as geoarcheology, geochemistry, bioarchaeology, ethnoarchaeology or experimental archaeology, as well as interdisciplinary analysis, are incorporated.

Altogether, contributions should enhance our knowledge about the identification, interpretation, preservation and restoration of earthen architecture.

ABSTRACTS

01 THE HABITAT STRUCTURES OF THE LATE NEOLITHIC OF BÒBILA MADURELL-MAS DURAN (SANT QUIRZE DEL VALLÈS)

Author(s): Plasencia Figuerola, Xavier - González Marcén, Paloma (CEPAP-Universitat Autònoma de Barcelona)

Presentation Format: Oral

The archaeological interventions carried out during the years 1991-1992 in the archeological site of the Bòbila Madurell (Sant Quirze del Vallès, Barcelona, Spain) revealed the existence of numerous Neolithic structures excavated in the soil. Two of them were well-defined habitat structures, in which several occupation phases were identified during the Late Neolithic period (2.600-2.500 cal BC).

The good preservation of these habitats and the archaeological methodology used during the excavation work have allowed the development of spatial analyzes, related to aspects such as morphometry of the dwelling, distribution of the internal structures, as well as the associated archaeological material.

This approach has determined a series of architectural elements and material culture that allow to expand the knowledge of the constructive techniques used in Neolithic habitat structures, the organization of inhabited space and the type of activities carried out inside.

Given that habitat spaces, both in the past and in the present, stand as the fundamental social and economic unit in agricultural settlements, the result of this research allows us to propose hypotheses and implications on socio-economic and cultural aspects of these agricultural communities during the period of full consolidation of the Neolithic communities in the central pre-coastal area of Catalonia.

02 DOMESTIC SPACE. THE EARTHEN ARCHITECTURE IN THE NORTHEAST OF THE IBERIAN PENINSULA DURING THE LATE PREHISTORY

Author(s): Mateu, Marta (Universitat de Barcelona. GRAP) - García, Elena (Archaeologist. Universitat de Barcelona; Mines Prehistòriques de Gavà research team)

Presentation Format: Oral

Little are known the earth-based elements from the Neolithic to the Early Iron Age in the NE region of the Iberian Peninsula. For this reason, we believe it is necessary to present some of the investigations that we have carried out or that are still under way. These

studies include fragments of elements that are part of the earthen architecture of the habitat (buildings) and the furniture structures used in the domestic spaces (combustion structures, containers, lids and other utensils). In most cases, these elements, made with the direct shaping technique (including: the mixed technique -wattle and daub or "torchis"- or the cob -"bauge"), are recovered remains in secondary position and constitute a representative percentage of our deposits.

With this work we want to present the studies and methodological approaches that we are applying: from the typological-descriptive study of the fragments, to the search of parallels, as well as the application of the micromorphology and in some cases some physicochemical analysis. To be able to understand this material, to be able to determine the composition and origin of the different components, their elaboration and their construction techniques. Our final aim is looking for the functions and uses of these elements, as well as the identification of areas and domestic spaces of origin. Finally, experimental archaeology is an indispensable tool for validating our hypotheses, while also helping to understand and disseminate it more effectively; bringing the results of research work to the public, and recreating aspects of the daily life of these societies.

03 BUILDING WITH COB BALLS. THE SINGULAR EARTH BUILDING EVIDENCES OF THE ARGARIC BRONZE AGE SETTLEMENT OF CARAMORO I (ELCHE, SPAIN)

Author(s): Pastor Quiles, María (University of Alicante)

Presentation Format: Oral

This paper presents a group of particular earth building remains documented in the Argaric Bronze Age settlement of Caramoro I (Elche, Alicante). These show the use of a construction technique almost unrecognised to date in the Prehistory of the Iberian Peninsula. Mud modelled in blocks, or cob balls, were used towards the end of the occupation of the site to rebuild, reinforce and coat part of some of the external walls. Initially considered as "adobes" two decades ago, after the new excavations at the site these materials have been rediscovered, interpreted and identified as the result of a different earth building method. Certain morphological criteria allow their interpretation as cob balls and differentiate them from others, such as hand-made adobe bricks. Characterising this technique and its modules is especially important due to the difficulties in distinguishing it in the archaeological record. This lack of recognition can be, among other factors, behind its invisibility in the archaeological literature. Very few parallels are known of the use of cob balls in prehistoric sites. Nevertheless, this technique could have been more common than it is now reflected in archaeological research. Therefore, it is crucial to define this way of building, also in relation to others, in order to make it visible. In so doing, this paper also aims to contribute to a better use of earth building terminology applied to archaeological construction remains.

04 DOMESTIC OVENS IN THE BRONZE AGE SETTLEMENTS IN THE NE OF THE IBERIAN PENINSULA: A CONTRIBUTION TO A SOCIO-ECONOMIC APPROACH

Author(s): López Melcion, Joan B. (Universitat de Lleida) - Moya Garra, Andreu (Itirta Arqueologia SL) - Alonso Martínez, Natàlia (Universitat de Lleida) - Gallart Fernández, Josep (Departament de Cultura Generalitat de Catalunya) - Bergadà Zapata, M. Mercè - Mateu Sagués, Marta (Universitat de Barcelona)

Presentation Format: Oral

Earthen vault ovens are now known in the Segre and Cinca Valleys from the outset of the second millennium cal BC to at least the Iberian period. This article analyses the morphology, construction technique and position in the settlement of five ovens from the Bronze Age sites of Minferri (Juneda, Lleida), Vincamet (Fraga, Huesca) and Paretetes (Albagés, Lleida).

The study begins with the interpretation of the oven's function, a problem common to the study of many sites. The hypothesis retained is that these features, although certainly polyvalent, were of culinary character linked to making flatbreads. This argument is based on positive data gleaned from micromorphological evidence, in particular as to question the temperature attained in the oven, and archaeobotanical remains (types of cereals). Negative data, notably the absence of evidence of other types of production, also bolsters this interpretation.

Yet the purpose of this study is to go further and attempt to link flatbread production in domestic settings with forms of ownership or usufruct of the land. To carry this out the study characterises the internal organisation of the three settlements as well as the spatial distribution of their different features of production (pottery, metals, food...) as potential indicators of domestic or communal production processes and the implications regarding the possession of these different means of production.

The study does not disregard the limitations of this methodological approach, especially in the case of the multiple options gleaned from ethnoarchaeology with respect to the forms of consumption and production of bread among ancient and current populations.

05 SEEKING THE INVISIBLE. EARTHEN ARCHITECTURE IN THE NORTH OF THE IBERIAN PENINSULA

Author(s): Ruano Posada, Lucía (Universidad Autónoma de Madrid)

Presentation Format: Oral

Traditional architectural studies of the North of the Iberian Peninsula in the Iron Age usually focus on the well-preserved circular or rectangular stone structures from the fortified villages, leaving in the background prior or contemporary structures made with earth and vegetal materials. Although mud fragments with wood impressions are frequent in the archaeological record, their study is usually limited to brief descriptions and a few drawings, which makes part of the biography of the settlements invisible.

With this paper, we want to present the results of the analysis of mud fragments from several archaeological sites of this territory,

in order to show the variety of earthen architectonic solutions adopted by these communities from the Early Iron Age to the beginning of the Roman period. Studying these fragments, we aim to understand the different materials used in these structures and the socioeconomic activities related to their operational chain. We are confident that this will greatly improve our knowledge of the use of the space in these settlements. Furthermore, we have introduced an ethnographic approach by studying contemporary earthen architecture from these same territories with the aim of better understanding aspects such as deterioration, maintenance activities and destruction processes, which we believe are difficult to infer from the archaeological record alone.

06 SOME NOTES ABOUT A POSSIBLE CHANGE IN THE CONSTRUCTION TECHNIQUE IN THE COPPER-BRONZE SEQUENCE AT THE DOURO VALLEY

Author(s): Fonseca de la Torre, Héctor (Universidad de Valladolid)

Presentation Format: Oral

Up until now, the research concerning constructive structures before the First Iron Age has been quite scarce at the Northern Spanish Plateau. This was due not only to the few remains in situ but also to the lack of interest about the clay plaster fragments, which commonly remained unknown. Recently, that tendency has changed and a new research focused on this kind of remains has started to be developed. These studies involve remains from chalcolithic sites exclusively, such as “El Casetón de la Era” (Villalba de los Alcores, Valladolid, Castille and Leon, Spain). The results confirmed the wattle-and-daub technique as the most usual for chalcolithic dwellings.

In the case of the Bronze Age, it has been traditionally proposed the construction of even flimsier dwellings considering the alleged more itinerant lifestyle of those populations. That idea was based on the lack of in situ remains, greater than in the previous period. However, this communication has the aim of widening that vision with the proposal of a possible change in the construction techniques during the Middle Bronze Age. This suggestion is based on the macroscopic study of several collections of clay plaster remains from both museum storages and excavations under development. The analysis has been especially focused on the presence of wooden imprints and their characteristics (diameter, abundance, and morphology), on the inclusions inside the clay matrix and on the finish of the surfaces. The main conclusion of the study is the existence of two kinds of settlement: the stable ones with solid constructions and the itinerants which built provisional structures.

07 EARTHEN ARCHITECTURES IN THE NURAGIC SARDINIA: THE CASE STUDY OF PALMAVERA (ALGHERO, SASSARI)

Author(s): Pais, Marta (Università degli Studi di Sassari)

Presentation Format: Oral

The aim of this paper is to present a regional synthesis about the use of earth as building material in Sardinian nuragic contexts that are chronologically referable between the middle Bronze Age and the early Iron Age (1800-700 BC).

The study, based on a data collection of bibliographical informations, shows how is documented this cultural phenomenon in different geographical areas of the island. On the basis of archaeological evidences, earthen materials have been recorded in 25 nuragic settlements; the majority of them are located in the southern part of Sardinia, especially in the historical Campidano region. It is important to highlight that in this geographical area the tradition of building with earth is actually still live and deeply rooted as a strong cultural feature.

Moreover, we present the case study of the nuragic settlement of Palmavera (Alghero, Sassari). During the latest excavation, carried out by the University of Sassari, it has been possible to identify a stratified deposit characterized by the presence of earthen elements in association with burned areas and ash layers.

The detailed study of this kind of artifacts, in connection with archaeometric analysis, experimental archaeology and ethnographical studies, can give a better understanding of building techniques used for constructing houses during the protohistory of Sardinia.

08 FIRST RESULTS OF THE PROJECT POACEA (PERSPECTIVES ON THE DIFFERENT SPECIES OF ARUNDO/ PHRAGMITES AND CASE STUDIES IN EARTHEN ARCHITECTURE)

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Presentation Format: Oral

This starting project is aimed to collect new data on the presence and diffusion of the different species of Arundo and Phragmites in prehistoric architecture (VI-II millennium BC), to enhance the knowledge on their origin, spread and use in Sicily and Southern France.

Burned daub fragments are frequently founded in archaeological contexts, giving a “negative” picture of the vegetal frame of the structures. Use of reeds is very frequent since the Neolithic. The partial conservation and the different shape of these remains, as well as the various use that earthen materials had for ancient communities, complicate their interpretation. The possibility to detect some indicators based on botanical criteria (morphology, anatomy and epidermis) on fragments and the prints to identify the two genus (or in some cases even the species) would be of great interest to recognise their presence and use in the archaeological contexts and their origin and spread throughout the Mediterranean area. The first prehistoric and protohistoric sites where these multidisciplinary investigations are taking place are: Case Bastione (Sicily, Italy); La Capoulière (Mauguio, Hérault, France); Mursia (Pantelleria, Sicily, Italy) and La Monédière (Bessan, Hérault, France).

Archaeobotanical and micromorphological analyses from the archaeological sites chosen – in some cases positive for the presence of reeds - can be matched with the first botanical analyses performed on daub prints and with the potential identification of phytoliths on the surfaces. This will enhance our knowledge on the paleoenvironmental framework of these areas and on technical skills for ancient architecture.

09 TRACING THE WORKINGS OF BUILDING TECHNOLOGY ON THE MICRO-REGIONAL LEVEL: THE CASE OF KASTORIA IN NW GREECE

Author(s): Kloukinas, Dimitris (Ephorate of Antiquities of Pthiotida & Evrytania, Ministry of Culture, Greece)

Presentation Format: Oral

The Neolithic assemblages of northern Greece are frequently dominated by rubble areas of burned, superstructural material belonging to post-framed dwellings and associated features (including hearths, ovens and other facilities). Fire-hardened daub fragments with impressions of the timber frame offer a vast amount of information on building materials and techniques. Nevertheless, for many years the material at hand had not been studied in its full potential. Architectural information was often restricted to empirical field observations, while the terminologies employed were more or less inconsistent. Hopefully, this attitude seems to have changed during the last two decades. Yet again, the results of the detailed studies conducted commonly refer to a single settlement and they are not always presented on the feature-level. This poses certain limitations to their comparative strength.

The present paper seeks to trace the workings of building technology on wider scales. Rather than being restricted to a single site, it will focus on a specific micro-region (i.e. Kastoria, NW Greece) encompassing various types of sites, as well as different architectural forms. The attempt will be to highlight the many-sided factors influencing the inhabitants' choices and to identify how widely shared certain technological conceptions are. The main focus will be on the material from the nearby sites of Avgi and Koromilia. The evidence from the settlement of Avgi derives from the rubble of three post-framed dwellings dating to the 6th millennium cal BC. The more or less contemporaneous Koromilia material comprises large quantities of daub fragments from various structures and possible pit-dwellings. The data will be supplemented by the evidence from the neighbouring sites of Dispilio and Kolokyntou.

10 BUILDING IN EARTHEN MATERIALS DURING THE LATE NEOLITHIC IN THE SOUTHWEST PARIS BASIN: A GEOARCHAEOLOGICAL APPROACH

Author(s): Onfray, Marylise (UMR 8215 - Trajectoires; Equipe Sol-DMOS, AgroParisTech)

Presentation Format: Oral

With regard to the ‘absence’ of Neolithic floors, research on households in the North of France is based on hollow structures, mainly postholes and pits, from which are drawn the maps of buildings. The knowledge regarding the constructive techniques of the walls is scarce because only fragments of wattle and daub are attested back to the early Neolithic. For the late Neolithic in the Southwest Paris basin, data is even more limited, since only a few building maps are known and weakly stratified sites with artefact clusters, although frequent, are rarely documented. A geoarchaeological study based on micromorphological analysis has been carried out on several weakly stratified or stratified sites located in different geomorphological and pedological contexts: Sours, Gas, Poupry, Pusigny and Maillé. The primary objective was to determine the processes of formation of the archaeological stratigraphy. In addition to the detection and identification of floors revealing different areas (domestic interior area, threshold floor, courtyard domestic floor), the analyses highlighted the presence of earthen architecture. The technological approach in micromorphology is based on the model established for protohistoric earthen material architectures and adapted to Neolithic architectures. It makes it possible to determine the architectural technical processes used for the earthen material: extraction, preparation, addition, shaping and implementation.

The purpose of this paper is to present the results of our analyses which attest to the presence of several construction techniques in cob: cob in lumps, cob layers or formwork cob. These new data shed light on the role of earthen material in the household arrangement and thus in the formation processes of archaeological stratigraphy. They contribute to question the relationship between cob and wattle and daub, the shape of the building and the cultural aspect of the earthen material in these Neolithic societies.

11 EXPLORING NEW METHODS ON SPACE ANALYSIS OF EARTHEN NEOLITHIC ARCHITECTURE: THE CASE STUDY OF KLIMONAS ON CYPRUS

Author(s): Mylona, Pantelitsa (UMR 7209, Muséum National d'Histoire Naturelle- CNRS- Sorbonne Universités) - Wattez, Julia (INRAP, UMR 5140- Archéologie des Sociétés Méditerranéennes) - Wils, Patricia (UMS 2700 Muséum National d'Histoire Naturelle - CNRS) - Vigne, Jean-Denis (UMR 7209, Muséum National d'Histoire Naturelle - CNRS- Sorbonne Universités)

Presentation Format: Oral

The PPNA site of Klimonas is located in the south of Cyprus in Limassol district. It is the first sedentary settlement on Cyprus and is dated to the 9th millennium BC. All the excavated buildings are constructed with the cob technique. A circular building (St10) of 10 m in diameter has been excavated and interpreted as a communal use. The filling of the St10 corresponds to three occupation phases. The stratigraphy is dominated by the earth used for the construction of both the walls and the floors. A geoarchaeological study applying the soil micromorphology was set up in order to clarify the organization of the space inside the communal building and the type of activities performed. This study shows a continuous occupation and use of the St10. The identification of different micromorphological features allows us to characterize the use of space of each occupation phase. Generally, the space seems to be used for food preparation and consumption but also spaces of infrequent use were identified during the second occupation phase.

Based on these results we explored new methods of space analysis and evaluated their application to a context dominated by the use of earth. The methods are the image analysis using the Image J software, the CT-scan of impregnated blocks and the statistic tests of activity indicators like bones, charcoal etc. This paper aims to present and criticise the protocol applied and the result acquired in comparison with soil micromorphology.

12 EARTHEN ARCHITECTURE AND BUILDING TECHNIQUES EMPLOYED IN THE CONSTRUCTION OF CERTAIN RESIDENCES OF MAS CASTELLAR – PONTÓS (NE IBERIAN PENINSULA)

Author(s): Asensio, David - Jornet, Rafel (University of Barcelona) - Morer, Jordi (MonlberRocs SL) - Pons, Enriqueta (Museu d'Arqueologia de Catalunya)

Presentation Format: Oral

This poster presents the archaeological find of a stately home at the site of Mas Castellar of Pontós (NE Iberian Peninsula), which shows some Greek influence in its architecture. The building techniques employed are clearly different from the ones observed in other Iberian settlements of the area. Up to now, it has been possible to excavate 225 m² of this house, where six rooms have been identified. The foundations and baseboards of this house are made of stone, whereas walls, roofs and other household equipment – floors, brick benches- were made of mud. The walls of the house, both internal and external faces, were covered with mud and lime-washed as well as painted in shades of red and white. The house was destroyed due to a violent fire (end of the 5th century BC), for this reason it has been possible to recover numerous construction remains. Above the rubble of the stately home was built a fortified town (first of the 4th century BC) where the construction on land was much more perishable.

The discussion is to ask whether this mode of earthen architecture was in classical antiquity a building technique more durable and with more advantages of security and isolation, than the use of construction on land practiced long ago within a local model.

13 BUILDING NEW HOMES, EARLY NEOLITHIC EARTHEN ARCHITECTURE AND DOMESTIC SPACES AT THE IBERIAN PENINSULA.

Author(s): Gómez-Puche, Magdalena - Vergès Bosch, Josep Maria - Polo-Díaz, Ana (Institut Català de Paleoecologia Humana i Evolució Social - IPHES)

Presentation Format: Oral

Recent advances on the study of Neolithic domestic structures in the Iberian Peninsula have benefited from the identification of a new archaeological evidence: daub fragments assemblages. Debris of hardened earth have provided the first direct evidence of prehistoric architecture in Early Neolithic sites.

Once it has been acknowledged the great potential of this archaeological material to improve our knowledge of the earliest farming village life in the Iberian Peninsula, different methodological approaches have been applied, starting from macroscopic description to geoarchaeological analysis based on soil micromorphology.

In this contribution, we present new results on technical aspects of daub fragments collections from two Early Neolithic open-air sites of the Iberian Peninsula, situated at different biogeographic areas: Mas d'Is and Los Cascajos. We have identified varied building techniques during the Early Neolithic period such as the use of wattle and daub technique, and cob and rammed earth. Aimed at deepening our knowledge of constructive techniques, we have applied micromorphological analysis in thin section and non-destructive instrumental techniques (SEM) to characterize the mineral and sedimentary composition of daub fragments.

Even if the local environment and the availability of raw material may influence the choice of one technique over another, we will investigate if it could be differences in labour investment at domestic spaces, according to particular architectural traditions or diverse degrees of intensity in the occupation of early Neolithic sites.

14 ANCESTRAL USE OF PLASTIC NANOCOMPOSITES FOR DURABLE EARTHEN ARCHITECTURE

Author(s): Courty, Marie-Agnes (CNRS) - Coqueugnot, Eric (Archeorient UMR 5133 CNRS)

Presentation Format: Oral

Ethnoarchaeological and experimental studies have intended to decoupling the role of raw materials and of technological abilities on the quality of prehistoric earthen architecture. The properties of the raw materials used in present-day landscapes for traditional earthen architecture is widely assumed to be representative of what was available in the past. We intend here to provide an alternative view by showing how polymer nanocomposites formed by assemblage of ionized aerosols produced during atmosphere electrification controls the spatial and temporal variability of earthen material properties.

We present the analytical protocol for characterizing the polymer nanocomposites from earthen architecture using the late PPNA-PPNB occupation sequence at tell Dja'de (Northern Syria). We summarize how analysis of present-day and ancient nanocomposites and of similar ones synthesized by electric discharge experimentation helps to understand their remarkable properties. We explain why their integration to the fine mass at nanoscales gives hydrophobicity, provides a durable plasticity (millennia and more), prevents fissuration while ageing, maintains a high thermal resistance to both frost and heating and decreases their bioavailability. We use earthen architecture from diverse cultural contexts of Northern Syria with similar composition to the tell Dja'de ones to show rapid ageing by bioturbation, wetting-drying and UV exposure when polymer nanocomposites are nearly absent or of low quality. We illustrate from changes in the general use of polymer nanocomposites from the early PPNB earthen constructions at tell Dja'de – particularly for the remarkable painted communal house of Dja'de I phase – to a more restricted use from Dja'de II to III phases, how the local populations have adjusted their technological knowhow to lower quality of the raw material properties. The latter would express decreased ionization events at a global to local scales in response to changes in the sources and transport routes of aerosols during the same time period.

15 SHAPING IN CIRCLE: EARTHEN ARCHITECTURE IN THOLOI AT VII- VI MILLENNIUM CAL BC IN NORTHERN MESOPOTAMIA

Author(s): Molist, Miquel - Cruells, Walter - Gomez Bach, Anna (UAB)

Presentation Format: Oral

The identification of domestic spaces has been carried out through a set of variables that include architectural morphology, kind of materials used, and presence of floors and rebuild floors and walls, plasters, combustion structures and other domestic devices, among others.

The identification of these spaces has not always been easy in circular constructions such as tholoi during the Pottery Neolithic in upper Mesopotamia. Architectural measurements, refilling materials (pottery, lithic, bones, etc), presence of doors and accessibility are also indicators of the existence of these spaces identified as domestic units.

In this contribution, the aim is to go deeper around the definition of domestic spaces through the examples recovered during the VIIth to the mid-sixth millennium cal BC in the main settlements of the Middle East. More specifically, evidences of earthen architecture such as tholoi through the stratigraphic sequence of Tell Halula (Euphrates Valley) and Chagar Bazar (Khabour, Valley) are being discussed. Other aspects such as temporary duration, evidences of use and abandonment will be addressed in this paper. We understand that the characterization of these spaces through diverse used materials (stone base, mud-brick, pisé) will help in the knowledge and definition of this particular Neolithic domestic architecture from its complexity and multifunctionality.

16 EVOLUTION OF THE EARTHEN STRUCTURES OF COMBUSTION, SOCIO-ECONOMIC CHANGES OF THE NEOLITHIC LEVANTIN: A HIGHLIGHTED CORRELATION

Author(s): Albukaai, Daa Eddin (Archéorient UMR5133)

Presentation Format: Oral

From 12000 BP and during five thousand years, the Middle East has been the theater of several essential and radical transformations, both in the symbolic and artistic life and in the development of equipment. The agro-pastoral economy, established at the beginning of the Neolithic, substitutes the Paleolithic mode of subsistence, based on predation and gathering. Moreover, and since the first attempts of constructions at the Kebarien period, societies have never ceased to innovate and improve the shapes, material and techniques of construction depending on their social and economic needs.

In the framework of a doctoral research at the University of Lyon II, the structures of combustion of five Neolithic sites, spread over the entire Syrian territory (Jarf el Ahmar, Tell 'ABR and Tell Halula, Wadi Tumba 3 and Tell Aswad), have been the subject of a thorough analysis. It has highlighted the morphological and techniques developments of these equipment in connection with different phases of the preceramic Neolithic. It has also allowed to suggest, through their location within the archaeological site, a socio-economic impact well beyond their function.

This presentation resumes the main points of this work, showing the correlation between the Neolithic cultural changes and the morphological and technical evolution of the combustion structures. It highlights the different use of earth to built these equipment, and the technical role of this material (earth) in the fire process of the combustion structure.

17 EXPLORING EARTHEN ARCHITECTURE BY MEANS OF MICROARCHAEOLOGICAL ANALYSES: A CASE STUDY FROM IVTH MILLENNIUM BCE ARSLANTEPE (MALATYA, TURKEY)

Author(s): Cereda, Susanna (University of Vienna)

Presentation Format: Oral

Earthen architecture represents an important object of study for archaeologists, in particular for those who aim at deciphering the social dynamics reflected in the use of space by looking at the microscopic material traces embedded in it. Indeed, earthen buildings, and specifically mud floors, given the permeable nature of its constituent material, have the capacity of entrapping and preserving the tiniest traces left behind by the interaction of people with the built environment (e.g. construction, use, modification). These traces, in turn, can be unraveled through the use of specific microarchaeological techniques and inform about the actions and events that resulted in their deposition.

In this contribution, the author will present the micromorphological investigations carried out on 4th millennium BCE buildings from the site of Arslantepe (Malatya, Turkey). During this period, the site experienced the formation of a proto-state system that found its physical expression in the construction of monumental mud-brick structures with administrative and ceremonial functions. These buildings had a central role in the socio-political dynamics of the period, and thus, the informative potential of the contexts, together with their remarkable preservation status, offered an excellent setting for the implementation of high-resolution analyses in these structures. Sediment samples were collected from different rooms of the buildings, revealing a wealth of microscopic evidence. Such evidence was then spatially analysed and integrated with known information from in-situ finds and architectural features, allowing for a more in-depth understanding of how people interacted with the space they occupied. The aim of the paper is to show how the use of a deposit-oriented approach may offer additional insights into the way people experienced their physical surrounding, thus enriching the archaeological narrative and our appreciation of earthen architecture.

18 CULTURAL RELATIONSHIPS AND TECHNICAL EXCHANGES BETWEEN NORTHERN MESOPOTAMIA AND SOUTHERN CAUCASUS COMMUNITIES DURING THE NEOLITHIC

Author(s): Baudouin, Emmanuel (Paris-Sorbonne University)

Presentation Format: Oral

Taking up the cultural relationships issue by means of the transmission of knowledge in architecture between the sedentary communities of Northern Mesopotamian basin and Southern Caucasus represents an original approach for the period going from the end of the 7th millennium to the middle of the 6th millennium.

The approach claims to be resolutely cross-disciplinary. Archaeological data checking is thorough, based on the development of a typological study through three approaches: material, architectural techniques and building's morphology. This method paired with the used of theoretical concepts of invention, spread, assimilation and technical inertia, such as defined by A. Leroi-Gourhan, enables us to replace changes observed in architecture into their chrono-cultural context.

In Northern Mesopotamian communities (Hassuna and Halaf cultures), "basic" techniques (cob, circular buildings...) are currently used, evidence of an apparent low degree of technicity. However, this lack of experience is relative if we consider the complexity of foundations and footings of the buildings and an understanding of the limits of the earthen materials by halafian builders.

In Southern Caucasus, we observed an apparent technical inertia throughout the 6th millennium. If gradual technical changes are observed (decrease in the size of the circular buildings, gradual standardization of module mud-bricks...), none major innovation has not been proven. Moreover, the exclusive use of plano-convex mud-bricks in the Shulaveri-Shomu culture (Middle Kura Valley), subterranean buildings in the Kura Valley and flat mud-bricks in the Araxe Valley, unveil a geographical area divided where technical differences are marked between the Kura communities and those of the Araxe Valley.

Is it possible to define a "center" and a "periphery"? Can technical affinities be interpreted as a technical spread or rather a convergence? How can we discuss technical and cultural relationships between these various communities?

a. CONSTRUCTING RELATIONSHIPS AMONG PLACES AND PEOPLE: CONTRIBUTING INFORMATION ON A PREHISTORIC LANDSCAPE

Author(s): Kaltsogianni, Styliani (Aristotle University of Thessaloniki)

Presentation Format: Poster

Archaeological references concerning our knowledge of the form of prehistoric helladic settlements are rare; besides, studies concerning prehistoric settlements are sometimes incorporated in wider studies that aim at a narration of archaeological knowledge as a whole.

The first study regarding exclusively the Neolithic era was entitled "Neolithic Greece" and was written by D.R. Theocharis; it presented an initial read and interpretation of the data accumulated so far and included a catalogue with the excavated sites as well. A more recent approach of the archaeological data of the Neolithic era followed, which was entitled "Neolithic Culture in Greece". Still, archaeological references are nowadays insufficient for two main reasons: on the one hand, only a part of the accumulated archaeological data is treated so far and on the other, the geographical as well as the chronological framework of these studies is limited.

This presentation underlines the necessity to fill the gap of our knowledge for prehistoric helladic settlements both at the inter- and

intra- regional scale and take into account landscape issues, too. Prehistoric archaeological investigations are marked out by two main fields: extensive excavations and systematic surveys. Northern Greece provides successful archaeological cases, so as to advance our archaeological synthesis: by learning from the past to benefit the future and face current challenges by the way we approach sites and landscapes.

b. DWELLINGS OF THE EARLY IRON AGE IN CENTRAL RUSSIA AND GERMANY: SOME PARALLELS

Author(s): Natalia, Syrovatko (Institute of Archeology of RAS) - Syrovatko, Alexander (Kolomna Archaeological Center)

Presentation Format: Poster

Archeology of Central Russia faced the question of space organization in dwellings in the early Iron Age (the Dyakovo culture). For many years it remained the subject of dispute. The sunken featured building (SFB) were supposed to be the main form of dwellings of the Dyakovo culture population. Later "sunken featured buildings (SFB)" began to be regarded as the results of an imperfect excavation methods. Since the traces of dwellings in the form of grooves with holes from pillars inside were discovered within the Dyakovo hillforts, they were reconstructed in different ways: as traces of log cabins or logs with unbroken knots. Only in recent decades the idea that these are traces of wattle wall structures has been implemented. The aim of our report is to focus attention on some resemblances with the dwellings in Northern Germany. There is a great number of dwellings with similar traces from the walls. In this case, what matters are findings of wattle remains that clearly explain the construction of walls. There are no similar conditions in Central Russia for a "wet" cultural layer for hillforts and the 'fence version' needs additional reasoning. The early dwellings of the Dyakovo culture are usually called 'long houses' in accordance with tradition. But they differ significantly from the German ones in their layout as there are no large halls or naves. They are divided into sections of two standards, large and small. Although the purpose of 'small' compartments is not defined, ideas were suggested that they were intended for keeping cattle. This is one more detail, if such interpretation is correct, which brings together traditions of dwelling arrangement in such remote regions (in addition to general building methods).

c. THE WOOD-EARTHEN ARCHITECTURE OF THE EARLY IRON AGE OF THE TRANS-URALS

Author(s): Tsembalyuk, Svetlana - Berlina, Svetlana (Federal Research Center Tyumen Scientific Center of the SB of the RAS)

Presentation Format: Poster

According to archaeological data, the wood-earthen architecture appeared in the Trans-Urals in the Neolithic (late 7th millennium BC). The wood-earthen house-building reached its full flowering in the Early Iron Age. The greatest variety of planning forms, types of structures, application of various construction methods, methods of heat insulation of dwellings, etc. are found among the materials of the Sargatka and Gorokhovo cultures (4th century BC – 2nd century AD). The houses of the Sargatka and Gorokhovo cultures are divided into elite ones, where the leaders and noblemen lived, and dwellings of poor people.

The elite houses are represented by one- two- or three-chamber semi-dugouts. The dwellings were of a frame-column or a carcass construction. Two ways of construction of frame-column houses were identified: 1. Walls were built in the technique of fencing. Vertical racks in such dwellings supported horizontal beams and unloaded them thereby. They also performed a function of fastening the structure, partially unloading the walls of a load of the roof, and provided the building with better stability. The roof was double- or four-pitched, depending on the area of the structure. A framework of the roof was insulated with a layer of grass and soil, or contained a thick layer of grass as a lightweight insulation. 2. A framework of the roof was situated on four or more vertical columns, against which small poles, split in half, and whole logs were leaned with a small tilt. All this was insulated with grass and turf from above.

The houses of log structure were single-chambered, rectangular or square, with dovetailed walls with or without residue, with a double- or four-pitched roof.

Poorer population lived in pyramid-shaped frame dwellings with a truncated roof, or conical dwellings insulated by grass and soil.

d. EARTHEN BUILDING MATERIALS EVERYWHERE! DETECTION OF EARTH STRUCTURES IN DIFFERENT NEOLITHIC AND BRONZE AGE ITALIAN CONTEXTS

Author(s): Peinetti, Alessandro (Laboratoire Archéologie des Sociétés Méditerranéennes, UMR 5140 - CNRS, Univ. Paul Valéry Montpellier 3, MCC; LabEx Archimede; Università di Bologna) - Boccuccia, Paolo (Soprintendenza Archeologia, belle arti e paesaggio per la città metropolitana di Bologna e le province di Modena, Reggio Emilia e Ferrara) - Cattani, Maurizio - Debandi, Florencia (Università di Bologna) - Gabusi, Rossana (Soprintendenza Archeologia, belle arti e paesaggio per la città metropolitana di Bologna e le province di Modena, Reggio Emilia e Ferrara) - Guidorzi, Giulia (GEA s.r.l.) - Magri, Alessandra (Università di Bologna) - Miari, Monica (Soprintendenza Archeologia, belle arti e paesaggio per la città metropolitana di Bologna e le province di Modena, Reggio Emilia e Ferrara) - Murgia, Demis (Università di Sassari) - Venturino, Marica (Soprintendenza archeologia, belle arti e paesaggio per le province di Alessandria, Asti e Cuneo)

Presentation Format: Poster

Most of the studies relating to earthen architecture in Italy are focused on burned remains of wattle and daub. The detection of unfired rests of earthen building and structures in Neolithic and Bronze Age sites is actually a challenge for archaeologists, due to the scarce visibility on the field, the lack of preservation and the complex processes involved in their decay and entrance in the archae-

ological record. The characters of the sedimentation related to these kinds of structures are often interpreted as undifferentiated natural layers, especially when artifacts lack, or simple anthropogenic backfill. The distinction between preserved earthen features and layers resulting from their decay is an additional complication for the correct detection of earthen structures.

A geoarchaeological approach to the sedimentation, involving the careful description and evaluation of the stratigraphy in the field, coupled with micromorphological analysis in thin section, could be useful to detect earthen architecture remains. All the Italian sites where this kind of approach was used revealed traces of earthen building materials, even if geographical and cultural contexts were very different.

In the insular Bronze Age sites of Mursia (Pantelleria) and Tanca Manna (Sardegna), when dry stone is the main building technique, earthen materials had an important complementary role for the realization of floors, plasters and furniture. Weak evidences show that earthen materials were employed to realize some walls as well. In the temperate context of Northern Italy the detection of these structures is particularly hard. However, the sites of Carbonara Scrivia, Minerbio and Solarolo (Neolithic, Eneolithic, Bronze Age) reveal a large use of earthen materials for the realization of different structural features.

The training and pedagogic process concerning the correct detection of earthen buildings, based essentially on similar experiences and works done in Southern France, played a central role for this research.

e. EARLY NEOLITHIC EARTHEN BUILDING IN THE PARIS BASIN: THE CASE OF TIGERY (ESSONNE, FRANCE)

Author(s): Wattez, Julia - Blaser, Romana (INRAP - National Institute for Preventive Archaeological Research)

Presentation Format: Poster

Early Neolithic villages, in north of France, are usually composed by clusters of long wattle and daub houses, associated with external pits located along the walls. Recently, another kind of settlement pattern has been uncovered during preventive excavation on the Plateau de Sénart, near Paris (France). Two unusual large pits with an oval or quadrangular shape are interpreted as the rest of dwellings. Occupation surfaces are not preserved, but these structures could be connected with fireplaces. The pits' infillings are well-stratified. The cultural remains are diversified (potsherds, lithic tools, bracelets made by schist or baked clay, animal bones) and it could be related to domestic use.

Another specificity of these pits is to contain the remains of earthen materials, such as massive silty layers or cob lumps fragments.

A geoarchaeological approach, using micromorphological analysis, was carried out on one of these pits, in order to better understand the biography of these structures and the building techniques used for their construction.

The results show two phases in the use of this pit. During the first phase, the pit corresponds to a built space. The pit's walls are plastered with a earthen coating made with a mixture of loess. An earthen constructed floor made with silty-clay material from various origins was realized at the bottom of the pit. It is regularly maintained and transformed by trampling. The second phase reveals a reconfiguration of the pit's space with the set up of an heterogeneous backfill. The remains of a cob structure lie above it.

Correlation between microstratigraphic and archaeological record brings new data on the earthen construction techniques and suggests a new interpretation as domestic activity areas for these unusual excavated features.

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ARCHAEOLOGY OF ROCK-HEWN SITES AND QUARRIES: PEOPLE, STONES AND LANDSCAPES

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Sciuto, Claudia (MAL_environmental archaeology laboratory, Umeå University) - Lamesa, Anais (Institut français d'études anatoliennes, Istanbul) - Whitaker, Katharine Alice (Department of Archaeology, University of Reading)

Format: Regular session

Archaeology of rock-cut sites is the archaeology of co-occurring agencies of humans and stones. It is the archaeology of the void left by daily activities and production, shape of living and lived spaces.

Caves and quarries are knots in the network of people-stone interactions. They serve as doorways between humans and the mineral world, as places of exchange and symbiotic relationships.

Quarries, tunnels, dwellings, churches, castles and tombs were carved in rock all across Europe throughout various periods and in different socio-cultural contexts.

Techniques of stone-cutting, extraction and implementation have changed over time as well as the organization of labor in building/carving sites and quarries. All of these enterprises rest upon the professionals who left these molded hollows as the only testimonies of their work. These chiseled surfaces between human lives and stone are mirrors of the socio-cultural context in which they were created, and their study discloses information about economical dynamics, technological advances, ways of living and symbolic beliefs.

Archaeologists have been combining different methods for the study and conservation of these peculiar features, integrating digital and analytical techniques. We are interested in communications that raise theoretical and methodological issues, in order to discuss the state of the art in the field of rock-cut sites studies. We would like to turn the attention of the international scientific community towards the relevance of

these sites and promote the creation of a European network of researchers. We invite students, scholars, to join us and share results, ideas, questions and critical issues.

ABSTRACTS

01 “WHAT ARE MEN TO ROCK AND MOUNTAINS?”¹ THE INTERDISCIPLINARY CHALLENGE OF ROCK-CUT SITES

Author(s): Sciuto, Claudia (Umea University)

Presentation Format: Oral

Since prehistory, humans have learnt to shape cliffs, carve mountains and dig tunnels. In different chronological periods and socio-cultural contexts, rock has become the scenario for everyday life: production, dwelling and rituals.

The long-term alliance between human and stone results in various rock-cut features. The study of these sites, at the same time cultural and geological, requires the application of interdisciplinary protocols. Facets of people, stones and landscapes can be recorded by many approaches: from the analysis of quarrying strategies and organization of labor, to the spread of lithic artefacts, from the documentation of a single tool marks to the understanding of a complex rock-cut architectures.

The combination of various methods is fundamental in order to map different agencies on multiple scales and represent the complex interactions of past societies and their stone landscapes. Chemical analytical tools, photogrammetry, GIS and Virtual Reality are some of the methods that can help disclosing and organizing different levels of knowledge about these important archaeological sites.

As introduction to the session, different theories and methods for studying rock-hewn sites and quarries will be described and discussed, highlighting issues and opening questions for the debate.

1_ Austen, Jane. 1853 *Pride and Prejudice*. Richard Bentley: London, p. 135.

02 ROCK-CUT CULT PLACES OF EGYPT

Author(s): Takacs, Daniel (University of Warsaw)

Presentation Format: Oral

Ancient Egypt is well-known for its emphasis on rock based monuments since this type of material was always abundant in the country. Rock-cut chapels serving the cult of deities sponsored by the state seem to have acquired prominence fairly late in the history of the state, in the New Kingdom only (ca. 1500-1000 BC) even though, that private funerary establishments hewn in stone had been flourishing for over a thousand years at this point. Members of the former type were often made in re-used quarry places close to in-progress quarry missions, and were frequently enlarged and received private contributions in subsequent eras. Their size is ranging from a few to hundreds of square metres and usually at the end of their usage; they were inhabited by Coptic Christian hermits providing the places with over a thousand years of usage and multiple modifications by this.

The paper would like to present the types and possible use of these rock-cut monuments in the wider context of cult places in Egypt. Private and state commissioned shrines will be compared with each other, common points and differences highlighted. As a short case study, the rock-cut chapel of Gebelein of south Egypt will be shown (the current place of work of the author and his team), where possible signs of subsequent modifications can be discovered.

03 BUILDING UNDERGROUND : DIGGING PROCESS OF PREHISTORIC FUNERARY HYPOGEA OF THE WESTERN MEDITERRANEAN

Author(s): Porqueddu, Marie-Elise (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence; Università di Sassari)

Presentation Format: Oral

At the end of Prehistory in the Western Mediterranean, the rock-cut tombs are a privileged type of architecture. The related literature is rich and focuses mainly on defining the types of planimetry, the funerary acts taking place in the structures or even the location in the landscapes and their role in the territories. However, the study of the complete operational sequence of the implementation of these structures remains poorly discussed. The understanding of the hypogeus digging process is essential in order to determine which techniques and strategies come into play in the establishment of these structures. In the context of a doctoral work, a method has been developed on the subject. It is presented in three lines of reflection: the technological study of digging macro-tools, the analysis of the traces which are present on the walls of hypogea using photogrammetry, and an experimentation to confirm or refute the assumptions made. These three axes were developed in different contexts, in France in the geographical area of the Bouches-du-Rhône with the monumental context of Fontvieille and in Sardinia with the necropolis of S'Elighe Entosu. The comparison between the various contexts selected in the western Mediterranean makes it possible to discern the existing differences and similarities in the digging process and also the choices made by the different human groups. Beyond the knowledge of the techniques used for the digging of these architectures, this study also allows to question their role within the community through the lens of the investment generated by their establishment.

04 DIGGING WHERE NATURE HAS ALREADY DUG: THE SOCIAL AND SYMBOLIC IMPORTANCE OF ROCK-HEWN TOMBS IN CENTRAL ITALY

Author(s): Rolfo, Mario Federico (University of Rome „Tor Vergata“) - Achino, Katia Francesca (Institute of Archaeology ZRC SAZU; Quantitative Archaeology Lab, Department of Prehistory, Autonomous University of Barcelona) - Angle, Micaela (Soprintendenza Archeologia del Lazio e dell'Etruria meridionale) - Gatta, Maurizio (Department of Archaeology, BioArch Environment) - Silvestri, Letizia (Durham University, Department of Archaeology)

Presentation Format: Oral

Rock-hewn tombs are renown sites in the Middle Bronze Age north of the Tiber River and in southern areas of the Peninsula, such as the Apulia region. On the other hand, these burial structures are extremely rare south of the Tiber in central Italy, where the high number of natural caves has played a key role in human burials during the 2nd millennium B.C. The site of Colle delle Grotticelle (Rocca di Papa, central Italy), a few km south-east of Rome, is the only case of such structures in this area.

This presentation will explore the possible reasons behind the costly choice of building at least two artificial hypogea in such a cave-rich territory during the Early/Middle Bronze Age: the energy expenditure shown for the building of these structures might indicate some kind of special treatment for a segment of the community, perhaps an emerging lineage.

Another key point that this work will address concerns the re-use of these landmarks over time. The two main chamber-tombs known for the Colle delle Grotticelle have been re-used in later times, one of it showing a jewelled cross carved at the entrance, and the other one a re-worked area comparable to hideouts for weapons used in World War 2. This has, on the one hand, created significant methodological problems, as the original deposits were almost fully erased; on the other hand, the long and diversified anthropic occupation of these artificial caves makes such rocky places even more fascinating to investigate and interpret.

Building upon the results of recent archaeological investigations in the Colle delle Grotticelle, this paper will combine theoretical approaches, ethnoarchaeology and archaeological science to reconstruct the meaning and importance of rock-hewn sites in Bronze Age central Italy and beyond.

05 INVISIBLE BUT NOT LOST. THE RECOVERY OF THE WALL DRAWINGS OF THE HYPOGEUM OF SAN SALVATORE DI SINIS (SARDINIA, ITALY)

Author(s): Trogu, Antonio - Cogoni, Martina - Ranieri, Gaetano - Piroddi, Luca - Loddo, Francesco (University of Cagliari)

Presentation Format: Oral

The hypogaeum of San Salvatore di Sinis (Sardinia, Italy) is one of the oldest evidences of the Christians in Sardinia which is probably superimposed on an oldest structure dated back to the Nuragic civilization (XVI to X century BC). The underground structure is characterized by decorations and inscriptions on its walls of several styles, cultures and languages, included Arabic, which currently are in a serious state of decay mainly for the presence of patinas primarily due to water infiltration.

In 2017, a multispectral survey was carried out to study the parts of the wall drawings that are almost fully disappeared because of the presence of patinas. The hypogaeum walls have been covered by 890 pictures with an overlap of 50% between contiguous images. Each picture has been recorded in five different spectral bands: visible, from about 400 to 720 nm; Ultra-Violet (UVA) under 400 nm; Near InfraRed (NIR) in three different ranges, over 720 (IR1), 850 (IR2) and 950 (IR3) nm respectively. Moreover, for each band three different images were recorded in three different exposure to detect the wider range of information as possible, therefore 4,450 pictures were recorded.

Post processing of UVA and NIR data was done by a MATLAB algorithm that allow to reveal several parts of the wall drawings underneath patinas. The Multi Images Stacking algorithm (MIS) makes an hypercolor cube of $3 \times 3 = 9$ level. Subsequently, it changes the colour's depth from 8 to 16 bits to preserve all information stored in the data and does a stack of all the level. The final product is a 16 bits grey-scale picture.

This technique makes possible to reconstruct many parts of drawings and inscriptions that are invisible to the naked eye, providing a valid support for archaeologists, historians and restorers.

06 THE SEMI-TROGLODYTE CHAPEL OF NOTRE-DAME-DES-SEPT-DORMANTS (MARMOUTIER ABBEY, TOURS, FRANCE)

Author(s): Morleghem, Daniel (UMR 7324 Citeres-LAT) - Lorans, Elisabeth (Université de Tours, UMR 7324 Citeres-LAT)

Presentation Format: Oral

The monastery of Marmoutier (Tours, France) founded by Saint Martin c. 370 is built partly in the Loire Valley and partly on the plateau of Rougemont. According to Sulpice Severus, saint Martin's biographer, and other early texts such as Gregorius of Tours's works, the cliff is occupied from the beginning of the monastic community which excavated caves to live in them. It has been used throughout the history of the abbey as evidenced by extensive underground quarries often reused for wine production.

Excavations carried out in 2016 and 2017 on the site of Notre-Dame-des-Sept-Dormants Chapel, on the first western terrace of the monastery, allowed to reconstitute the topographical and functional evolution of the place between the very beginning of the Early Middle Ages and the end of the 19th century. Several collapses of the hillside and old « excavations » removed much of the remains and almost the whole stratification. The analysis thus focused on the few preserved cavities and masonry, as well as on the rocky

ground where many post holes and tombs are still visible.

A small semi-underground cemetery developed in the Early Middle Ages, which may be contemporary with troglodyte occupation further west. A small oratory is built around the 8th-9th century, which is replaced in the 12th century by a larger Romanesque chapel, partly dug into the rock and partly built in stone. After several collapses and the destruction of the building in the 18th century, a small chapel is built in 1881 which still survives.

07 CREATING A ROCK-CUT TOMB IN TRADITIONAL TANA TORAJA (SULAWESI, INDONESIA): AN ETHNO-ARCHAEOLOGY OF STONE ECONOMY AND RITUAL

Author(s): Robin, Guillaume (University of Edinburgh) - Adams, Ron (Simon Fraser University)

Presentation Format: Oral

The Toraja people from South Sulawesi (Indonesia) are well known ethnographically for their elaborate funerary ceremonies and conspicuous kinship houses. Less attention has been given to their *liang pa'* ("cut tombs") monuments, which are expensive graves executed by specialised stone artisans for noble families belonging to the wealthiest part of the society. This tradition has probably started in the late 17th century and is still living today, which offers a unique opportunity for archaeologists to investigate its material, social, ritual and economic dimensions.

This paper is based on a recent ethno-archaeology fieldwork project in Sulawesi (Indonesia), combining sites survey and interviews with tomb owners, stone artisans and ritual specialists. It describes the different steps involved in the complex process of creating a tomb, from reserving a location on a rock face, to the negotiation of the costs, organising and carrying out the cutting work, and the reuse of the extracted stone material for other purposes.

The research shows how economic, technical and ritual considerations are intertwined throughout the process. Creating a rock-cut tomb in Tana Toraja is not just a technical enterprise: it is also an expression of traditional beliefs, of the ritual relationship between the Toraja and their landscape, and the social value of stone as a material associated with death and status.

08 IF TECHNIQUES HELP DATING A ROCK-CUT MONUMENT...THREE CASE STUDIES

Author(s): Lamesa, Anaïs (French Institute of Anatolian Studies)

Presentation Format: Oral

It is quite complicated to date a carved monument by techniques as most of the time, carved technologies seem to be permanent or adapted to a specific geology. With three cases of study however, it is possible to propose some hypothesis and show how dating from carving techniques could be performed.

The first two are located in Cappadocia, in the central Anatolia. Over ten years, we conducted surveys in order to study techniques of carved building site. After observations of tools marks and comparison between tombs and churches, we were able to define a typology of tools. We were able to pinpoint some evolutions in the tools boxes of stone workers and some tools, specific of one period, were identified. These remarks seem not to be specific of Cappadocia, where monuments are carved in soft ignimbrite, and they could be used to date other sites in the Near East.

The third example is located in Tur Adbin, an area in the East of Anatolia, close to Mardin. In the village of Daras, that was founded in the 5th century, a necropolis was carved. By literature sources and observations of landscape, it is possible to date this necropolis. Inside the necropolis, a tomb – which is called "galeri mezer" by the Province Archeological Museum of Mardin – is realized with techniques different than other tombs. These specific techniques used to carve the "galeri mezer" confirm guess of historians about date of its realization.

09 STONES FOR LIVING AND LIVING STONES: NEW APPROACH TO THE STUDY OF STONE EXPLOITATION IN AUVERGNE (FRANCE) DURING THE MIDDLE AGES

Author(s): Cocoual, Antoine (W3D's) - Mallard, Constance (Laboratory LAHM, University of Rennes 2)

Presentation Format: Oral

Auvergne is a mountainous region, characterised by a succession of high mountains, big flat plateaus and large valleys. In this volcanic landscape (the last volcanoes were still in activity during the Neolithic) the geological context, formed by numerous lava flows and debris avalanches shows a great complexity. This complexity is still highly visible in the panorama where hard rocks contrasts with other stones more proper for exploitation. In this frame, the dynamics of exploitation of geological resources is a central element in the comprehension of the progressive landscape appropriation by ancient human communities.

Across the centuries, the Auvergne landscape has been strongly marked by human action and it is hard to find a parcel blank of archaeological records. The medieval period (IX-XV century) is characterized by settlements located on rocky peaks and plateau slopes. The particularity of those sites is that most of them are made up of two parts: a rock-cut settlement and a village constructed on a series of terraces. Two sites that shows the interaction of rock-cut cavities and terraced villages will be presented and compared: the village of Boissieres (Murol, Puy-de-Dôme) and the castle of Chateauneuf (Saint Nectaire, Puy-de-Dôme).

The analysis of this type of settlements with new investigation techniques such as photogrammetry and virtual reality brings new elements in the comprehension of human occupation and stone exploitation in Auvergne during the medieval period.

10 WHERE AND WHEN IS THE QUARRY? METHODOLOGICAL PROBLEMS IN THE INVESTIGATION OF AN EPHEMERAL QUARRY

Author(s): Whitaker, Katy (University of Reading)

Presentation Format: Oral

Quarries are very varied places. In the UK, they include immense pits like the Mountsorrel granite quarry (Leicestershire), long adits leading to underground caves for chalk at Totternhoe (Bedfordshire), whole mountainsides of slate at Penrhyn (Wales). At these quarries, the archaeological problem is that the quarry erases itself. But other stones are harder to find and their exploitation leaves smaller clues. These include materials like British jet and shale, taken from cliff-sides in Yorkshire and Dorset, arguably more evident in the objects worked from the desirable material than at their source locations.

Sarsen is somewhere in-between. Sarsen is a stony material both very evident in its use, and at its source. It was used most famously to make the huge trilithons and lintelled circle of the late-Neolithic settings at Stonehenge (Wiltshire). It has been exploited ever since, most recently in buildings, street-furniture, and 'new' prehistoric monuments. Sarsen boulders lie scattered about the surface across parts of southern Britain. Things made of sarsen, and the places to quarry the stone, are evident. But the quarry is almost exclusively on the surface, and scattered over hundreds of kilometres.

This presents unique problems. In order to explore the human-mineral interactions resulting in these structures, to begin to understand the network, it is essential to distinguish between the quarrying of different times for different purposes. The paper discusses methodological problems of researching an ephemeral quarry, showing how it is essential to debate a range of theoretical approaches to the interpretation of stone, and building with stone, through two case studies of sarsen use.

11 NOT ALL ABOUT THE QUARRIES?

Author(s): Nyland, Astrid (Museum of Archaeology, University of Stavanger)

Presentation Format: Oral

Pragmatic aspects such as availability and high quality raw material cannot solely account for the use of a Prehistoric quarry. Furthermore, whereas scale of extraction, remote location, or time-depth of activity may impress and induce a sense of a site being extraordinary, scale is not necessarily that which made a site significant. In order to characterize a site, to identify varying value and significance given place, rock, and procurement practices, a relational perspective and differentiation between contemporary sites is necessary.

Studying quarry sites as part of a *chainé opératoire* render visible the many choices involved in lithic procurement practices. The quarries, tailing piles, workshop sites, and debitage at settlement sites are all part of the practice, as is the quarried rocks' wider distribution and actual use in contemporary societies. My point of departure is a recent comparison of more than 20 quarry sites in Norway, dating from the Mesolithic to the Pre-Roman Iron Age, but I will also exemplify with sites beyond Norway.

Over time, deliberate and repeated choices of ways to procure rock, be it quarrying or not, become traditions. Thus, socially situated practices such as lithic procurement can be regarded strategic, socio-political, and sometimes even ritual. Dependent on social context, the exploitation of specific quarries can represent local affinity in their monumentality and time-depth, other sites may have been social arenas for specific activities, and still others may have gained a 'mythical' or status reflected in an over-regional desire for that particular rock.

12 QUARRIES AND CULTS IN THE CYCLADIC ISLANDS: A CASE STUDY OF PAROS AND NAXOS

Author(s): Angliker, Erica (Institute of Classical Studies - University of London)

Presentation Format: Oral

The principal activity of a quarry typically concerns the extraction of rock, which produces conspicuous voids in the local rock formation. However, the use of ancient quarries was not limited to this operation; religious activities also occurred in these spaces. The present paper explores the use of quarried rock formations in religious practices held at two different quarries in the Cyclades: Paros and Naxos. First, we analyze the quarry in Marathia in Paros, where one of the voids left by quarrying was used to house a relief dedicated to Nymphs, thereby becoming a focal point of religious worship. The void is compared with similar formations used for the same purpose found in other quarries. We also briefly discuss how to identify cultic places in rock structures. In the second part of our paper, we analyze some inscriptions mentioning Apollo found in the quarry of Naxos. We argue that the inscriptions, which were carved into the rock, do not indicate the ownership of Apollo over the rock, but rather delimitate the rock as a focal point for worship of the god. In order to reinforce our argument, we examine some cases of inscribed rocks, which also marked a place of worship, at other sanctuaries in the Cyclades. By investigating the interaction of rocks and men at these two quarrying sites, on Paros and Naxos, we can shed further light on the religious activity which occurred in such places.

13 METHODS OF STUDYING THE SARCOPHAGI QUARRIES OF THE HIGH MIDDLE AGES IN TOURAINE, POITOU AND BERRY (FRANCE)

Author(s): Morleghem, Daniel (UMR 7324 Citeres-LAT)

Presentation Format: Oral

The production of stone sarcophagi is the main extractive activity of the early Middle Ages. In the Center of France (Touraine, Poitou and Berry), it is characterized by production centers consisting of several underground or semi-underground quarries. These archaeological sites are also characterized by the conservation in negative of a very tangible activity, whose study makes it possible to catch the acts of the quarrymen, the organization of the work and the rhythms of productions. This study is dependent on the conservation of the remains (destruction by the continuation of the exploitation, recovery of the quarry fronts or collapses) as well as by the legibility of the traces of extraction (eroded walls, presence of saltpeter, etc.).

This paper will present the issues of research on sarcophagi quarries and the methodology developed in recent years for their study. The development of a multiscale analysis grid (tool trace, block negative, wall and quarry) and the use of adapted survey techniques (manual or with a 3D scanner for example) have made it possible to better understand the work of quarrymen on the one hand, the operation of the sites on the other hand, notably through the establishment of chronological topographies of the exploitations.

14 MEDIEVAL QUARRYING TECHNIQUES IN THE MOUNTAIN AREAS (EXAMPLES FROM SW POLAND)

Author(s): Lisowska, Ewa (Institute of Archaeology, Wrocław University)

Presentation Format: Oral

This paper presents an overview of stone mining techniques and forms of medieval quarries in the Sudety Mountains, based on long-term field research (2007-2018) conducted by Institute of Archaeology, Wrocław University.

In medieval Poland, mountainous areas were among the main sources of supply of stone raw materials. They were exploited using various techniques. Initially, during the early Middle Ages, the technology of exploitation in pit quarries, surface quarries and collecting of raw materials directly from the surface dominated. Most of these structures were relatively shallow. In this time the exploitation of raw materials directly from the rock deposit in open quarries is relatively rare. They appear on a wider scale in the 11th-13th centuries. At that time, as well as in the late Middle Ages, the size of pits and escarpment quarries is also significantly larger.

The dominant method of obtaining raw materials was to extract it using tools such as chisels, wedges and hammers. To this day, medieval traces of such exploitation are visible in the Sudeten Mountains. In addition to mechanical separation, rocks were extracted using the thermal method. Traces of such exploitation were discovered in several archaeological excavations.

Research on the exploitation of stone raw materials in Sudeten is still ongoing within the new project „Man and the environment in Sudeten during the early Middle Ages” sponsored by National Humanities Development Program.

15 USES AND EXPLOTATION OF PLASTER THROUGH LONG DURATION IN CONSTRUCTION IN ILE-DE-FRANCE

Author(s): Ivan, Lafarge (Département de la Seine-Saint-Denis)

Presentation Format: Oral

Gypsum is one of the most important stone resource in Ile-de-France (region of Paris). As a consequence, plaster has been the most important building material used since Middle Ages. It also has largely been used for render and decoration. However the modern gypsum exploitation is well known as much by the legislation which begins to be described in the Renaissance than by the quarries before industrialisation, the exploitation during Antiquity and Middle Ages is nearly unknown: only two medieval quarries are documented by archaeology.

a. THE MEDIEVAL NECROPOLIS OF PLA DELS ALBATS, OLÈRDOLA (BARCELONA). FIRST RESULTS

Author(s): Molist, Núria (Museu d'Arqueologia de Catalunya; Equip de Recerca Arqueològica i arqueomètrica de la Universitat de Barcelona - ERAAUB) - Ripoll, Gisela (Universitat de Barcelona; Equip de Recerca Arqueològica i arqueomètrica de la Universitat de Barcelona - ERAAUB) - Esteve, Xavier (Equip de Recerca Arqueològica i arqueomètrica de la Universitat de Barcelona - ERAAUB)

Presentation Format: Poster

The Pla dels Albats necropolis is one of the most remarkable anthropomorphic rock-cut graves of the Iberian Peninsula. Documented since the late 19th century and a reference for this type of cemeteries, it had not been the subject of scientific work to date. Within the framework of the ECLOC project (Ecclesiæ, cœmeteria et loci (sæc. VIII-XI). Sancti Cirici de Colera, Sidilianum, Olerdola / Es-glésies, cementiris i hàbitats (segles VIII al XI). Sant Quirze de Colera, Sidillà, Olèrdola) (Quadrennial research projects in archaeology and palaeontology 2014-2017, Num. Exp. 2014/100480, Generalitat de Catalunya) we started the intervention in the neighborhood outside the wall of the medieval city of Olèrdola (beginning of the 10th century - beginning of the 12th century).

Almost all the archaeological remains of this suburbium are cut in calcareous rock (habitat, streets, productive spaces and storage structures like silos). The church of Santa Maria and its necropolis that surrounds it make up the main place, located in the most preeminent part of the hill.

The recent works started in the cemetery area allow to size the necropolis and to define the limits of the “sagrera”, to document new

graves (about 160), pathway and internal organization, as well as to study the first anthropological remains. Two singular tombs are been found into the church.

b. MEDIEVAL ROCK-CUT WINE PRESSES AND CELLARS IN OLÈRDOLA (BARCELONA). A RECENT DISCOVERY

Author(s): Esteve Gràcia, Xavier (Equip de recerca en arqueologia i arqueometria de la Universitat de Barcelona - ERAAUB; Triade Serveis Culturals) - Molist, Núria (Museu d'Arqueologia de Catalunya; Equip de recerca en arqueologia i arqueometria de la Universitat de Barcelona - ERAAUB) - Ripoll, Gisela (Universitat de Barcelona; Equip de recerca en arqueologia i arqueometria de la Universitat de Barcelona - ERAAUB) - Pecci, Alessandra (Equip de recerca en arqueologia i arqueometria de la Universitat de Barcelona - ERAAUB) - Farré Huguet, Jordi (VINSEUM) - Peña Cervantes, Yolanda (UNED)

Presentation Format: Poster

The archaeological works carried out in the last decades in the medieval city of Olèrdola (Alt Penedès, Barcelona) come into view some presses of different types both inside the walled enclosure and in the suburb of Santa Maria outside walls as well as in the rock houses of the nearby cliffs of La Vall. The so far seven rock presses identified and the numerous references to the cultivation of the vineyard in the medieval documentation of the 10th and 11th centuries within the castral term show the importance viticulture had in Olèrdola during the High Medieval periode.

Our approach will focus on a possible winery identified in the recent excavations carried out within the framework of the ECLOC project (Ecclesiae, coemeteria et loci (sæc. VIII-XI). Sancti Cirici de Colera, Sidilianum, Olerdola / Esglésies, cementiris i hàbitats (segles VIII al XI). Sant Quirze de Colera, Sidillà, Olèrdola) (Quadrennial research projects in archeology and palaeontology 2014-2017, Num. Exp. 2014/100480, Generalitat de Catalunya). The press is located in an high area, taking advantage of the natural slope of the rock to facilitate the pressing process and it is composed of a square press plate, a little settling basin and four storage tanks of must for fermentation, which are connected to each other by means of channels.

Residue analyses of samples of the calcareous rock and lime mortar from two of the deposits are in progress to confirm the function of the production installation.

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URBAN ARCHAEOLOGY ON THE AGENDA: STARTING AN EAA COMMUNITY FOR URBAN ARCHAEOLOGY

Theme: Archaeology and the future of cities and urban landscapes

Organisers: Bouwmeester, Jeroen (Cultural Heritage Agency of the Netherlands) - Belford, Paul (Clwyd-Powys Archaeological Trust)

Format: Discussion session

Archaeological remains within highly dynamic urban contexts are under pressure. The economic and time pressures of large-scale developments, combined with the high cost of preserving these remains, mean that archaeological preservation in-situ or ex-situ is often difficult. After the session 'Managing archaeology in dynamic urban centres' at the EAA in Maastricht, it became clear this is a pan-European problem and that a platform is needed to discuss these matters to improve the interests of urban archaeology now and for the future. This is the reason we would like to form a community within the EAA on this subject. This round table session will be the start of the community.

The round table session will coincide with the publication of the proceeding of the 2017 Maastricht session. It addresses many different problems and challenges urban archaeologists have to face. In this session first we would like to start with identifying the main issues for urban archaeology and prioritize them. In the second part of the session we will split into smaller groups to discuss the top issues further. This will provide an agenda for action which the EAA Community for Urban Archaeology can take forward in the coming years. We will also determine the organizational structure of the Community.

ABSTRACTS

01 INTRODUCING THE START OF A EUROPEAN COMMUNITY ON URBAN ARCHAEOLOGY

Author(s): Bouwmeester, Jeroen (Cultural Heritage Agency of the Netherlands)

Presentation Format: Oral

Urban archaeology, and especially the archaeology of the medieval and post medieval towns, is relatively young. The archaeological agenda has focused mostly on the countryside and the pre-medieval period. One important reason for this is that the archaeological remains in urban contexts are mostly hidden under buildings and roads. It is no coincidence urban archaeology emerged rapidly after World War 2. Bombed towns had to be rebuilt, and later restructured during the urban renewal. These activities revealed many medieval and post medieval archaeological remains. Urban archaeology grew in importance. But 70 years later, still urban archaeology confronts many difficulties. One is the dynamic urban environment. It is extremely difficult to defend the archaeological interests against all the other interests which are at stake. Urban excavations are expensive as is building while keeping the remains intact.

Another difficulty is the problem of sharing knowledge. Knowledge of archaeological heritage management in urban context but also of research data. Urban archaeology is often very much focused on one town only, while a broader view could be very beneficial. Sharing knowledge is a key factor in improving the position of urban archaeology. The session Managing archaeology in dynamic urban context last year in Maastricht showed that urban archaeologists all over Europe confront the same problems. By bringing urban archaeologists together and sharing knowledge and inspiring each other, we as a community can help to improve urban archaeology in Europe. Together we will set the agenda for the next decade and start building for the future...

02 URBAN ARCHAEOLOGY AND CONSERVATION OF ARCHAEOLOGICAL SITES IN LUXEMBOURG – POTENTIAL CONFLICT OR VALUABLE ADDITION TO MODERN CONSTRUCTION?

Author(s): Bis-Worch, Christiane (Centre National de Recherches Archéologiques, Luxembourg)

Presentation Format: Oral

Today's urban dynamics cause enormous pressure to urban archaeology and to the conservation of archaeological sites in the cities all over Europe. It reveals that the competent authorities of various countries facing this pressure found many ways how to respond and how to mobilize the resources necessary to excavate and/or to protect their archaeological patrimony.

In Luxembourg, we try to integrate archaeological sites as much as possible into new buildings and to make them even accessible to the public. Some of these Luxembourgish solutions will be presented in this paper, focusing on the conflict between developers, city council, ground-owners, architects and archaeological heritage at the beginning of each project, resp. the excavation and the solution finally found. We will see, that the integration of our patrimony into new buildings can be very fruitful for the project and help the people to become more aware of their past resp. to help new habitants to get integrated. This is especially important for a small country like Luxembourg with its international community. Furthermore, we will focus on some legal aspects of the current legislation in Luxembourg and discuss the pros and cons of each project after some years of experience (public acceptance, vandalism, conservation problems etc...).

03 JOINING CLIMATE CHANGE ACTION: AN ARCHAEOLOGICAL PERSPECTIVE ON MULTIUSE MARINE PROTECTED AREAS

Author(s): Oaie, Smaranda (University of Malta)

Presentation Format: Oral

In recent years, the effects of climate change and environmental pollution have become more visible and better understood. To name only a few, we are causing and are affected by sea level change, ocean acidification, extreme weather and biodiversity loss on a global scale.

Simultaneously, growing populations are expected to constantly drive urban growth over the next decades, with the majority living in coastal areas, thus accelerating degradation marine ecosystems and archaeological sites over national borders. Yet, what importance place fast-growing societies on cultural heritage in face of immediate needs such as housing, food and infrastructure?

The future of many archaeological sites, endangered species and habitats, will depend on the ability to communicate the notion of cultural and ecological heritage, not as detached prestige projects, but as assets of fundamental importance, especially for young, urban and displaced people. One possibility to engage with conservation issues are Marine Protected Areas, as they operate in the same space, face the same threats and share the same goals as maritime archaeologists and local communities. Combining efforts could save time, resources, funding, help with capacity building and create jobs.

Archaeologists have the unique opportunity to foster relationships to a variety of stakeholders such as fisheries, food producer, sustainable urban projects, NGOs and the tourism industry. The discipline is located at the crossroad between people, land- and seascape and can occupy a key role in bridging separately acting environmental and cultural caretakers. While currently optional, cultural-ecological and cross-sectional networks are likely to become a most effective tool to tackle today's big social, economic and environmental challenges. This paper explores how archaeologists can make ecologically informed decisions in practice and academic teaching.

In conclusion, to preserve our heritage, archaeologists and environmentalists need to create a unified presence in the debate for the future.

04 RESEARCH ON ARCHAEOLOGICAL DIMENSION OF WORLD HERITAGE CITIES: RESULTS TO SHARE WITHIN EAA COMMUNITY

Author(s): Castillo, Alicia (Dep. Prehistory, Ancient History and Archaeology. Faculty of Geography and History. Complutense University of Madrid)

Presentation Format: Oral

Following a cross-disciplinary perspective, this paper intends to sum up conclusions concerning several studies about archaeological dimension of world heritage cities. Our team has been researching for some decades, and since 2007 within competitive national and international projects in this issue. With a strong and logical representation of archaeology and architecture professionals, our research team counted with specialists in law, information technology and communication, philology and anthropology, which we consider essential to develop working models in Cultural Heritage in the cities.

From cultural heritage management, with some exceptions as Rome, historic urban landscape has been scarcely taken into account the archaeological perspective, neither in the prevention field nor in that of social impact and, therefore, our science has a poor dissemination among citizens in the most of the cities in the world (even in Europe if you compare the number of towns with a significative archaeology and the rest). In fact, in academic media the impact of urban archaeology as a global vision of the city is very poor. A new EAA community is an opportunity to share the results of our researches and try to contribute to improve urban context from socio-archaeological perspective.

Castillo, A., Yáñez, A., Domínguez, M. y Salto, I. (2015) Citizenship and heritage commitment: looking for participatory methodologies adapted to the urban cultural heritage context. En Proceedings 8th ICOMOS General Assembly and Symposium: "Heritage and Landscape as Human Values". "Heritage and Landscape as Human Values". (2014).

Alicia Castillo Mena; Ana Yáñez; Marta Domínguez. Citizen perceptions about world heritage and archaeology in three Spanish cities: first methodological case studies. Complutum. 27 - 2, pp. 295 - 314. Universidad Complutense de Madrid, 2016.

Castillo, A. and Menéndez, S. (2014) Managing Urban Archaeological Heritage: Latin American Case Studies International Journal of Cultural Property, 21: 55-77.

05 URBAN ARCHAEOLOGY IN ITALY: BETWEEN UNRESOLVED ISSUES AND NEW PROJECTS

Author(s): Boi, Valeria - Calandra, Elena - Acconcia, Valeria - Falcone, Annalisa (Ministry of Cultural Assets and Activities and of Tourism, Central Institute for Archaeology)

Presentation Format: Oral

The discussion about urban archaeology in Italy started in the second half of the XX century. In a few decades the the post-war reconstruction of the medieval and renaissance italian towns brought to light the need to protect the historical city centres and the archaeological remains which emerged during the excavation works. In the following years the construction of modern infrastructures speeded up the distruction of archaeological remains and layers, sometimes without proper documentation.

At present days, notwithstanding the gradual affirmation of high standard of stratigraphic excavation, data collection and recording, some key-issues of urban archaeology still remain unresolved:

- the standardization of the documentation and the harmonization of data recording between Mibact, University and heritage professionals
- the timing and quality of publication and dissemination of newly acquired data
- the easy access to archaeological information
- the collaboration between heritage agencies and local authorities

The Central Institute for Archaeology (ICA, Istituto Centrale per l'archeologia), was established in 2016 as a part of the Directorate-General of Archaeology, Fine Arts and Landscape of the Italian Ministry of Culture, with functions in the field of archaeology and research in the broader sense. One of its primary goals is the review of the archaeological data archives and their online publication, also in open data format, with a view to establishing a single web portal for collecting, organizing and sharing archaeological data. The "National archaeological geoportal" may 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. ICA will also provide guidelines and tools to integrate the datasets which will be published in the geoportal, and develop a standard license agreement for data sharing and reuse, in order to harmonize open access policies to archaeological data.

06 THE ROLE OF GEOPHYSICAL TECHNIQUES FOR THE COMPREHENSION OF COMPLEX ARCHAEOLOGICAL DEPOSITS IN URBAN SITES IN THE MEDITERRANEAN BASIN

Author(s): Strapazon, Guglielmo - Sarris, Apostolos (Laboratory of Geophysical - Satellite Remote Sensing & Archaeo-environment Foundation for Research & Technology, Hellas - F.O.R.T.H., Institute for Mediterranean Studies - I.M.S.)

Presentation Format: Oral

Many urban sites in the Mediterranean basin have been inhabited continuously during the last three millennia. When an urban site is inhabited for such a prolonged period of time, deeply complex multiphased archaeological deposits are generated. The study of those archaeological evidences, both buried or standing, provide a unique opportunity for the comprehension of the evolution of urban sites.

Nevertheless such deposits are in continuous transformation as natural and anthropogenic post-depositional processes keep on modify them. Among this processes the one that threatened more the archaeological deposits, and especially it's more superficial portion, is the ongoing and extensive urbanisation.

The study of such archaeological evidences in urban environment (urban archaeology) have been developed greatly in the past 40 years, focusing mainly in the integration of building archaeology and archaeological excavation. Specifically, building archaeology focuses on the reconstruction of the history of existing buildings, using direct observations of the building themselves, while stratigraphic excavation is used to extract historical information from deeply stratified multiphased archaeological buried deposits. However, this approach has many limitation, as archaeological excavation in complex multiphased urban sites are extremely time consuming and expensive and excavation are usually limited in size.

The use of non-invasive analysis, and in particular of high resolution geophysical techniques, offer a unique opportunity to push further the development of the typical approaches of urban archaeology.

As a contribution to the round-table we would like to bring our experience in several urban context in the Mediterranean Basin (the historical city center of Padua- Italy and the city center of Rethymno, Creete) where geophysical survey has been integrated with building archaeology, archaeological excavation and historical documents.

Part of this work was financially supported by the Stavros Niarchos Foundation within the framework of the project ARCHERS.

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FROM CENTRAL SPACE TO URBAN PLACE. THEORIES, METHODS AND MODELS FOR ANALYZING PROCESSES OF URBANIZATION IN A EUROPEAN PERSPECTIVE

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Runge, Mads (Odense City Museums, Denmark) - Hansen, Jesper (Odense City Museums, Denmark) - Iversen, Frode (Department of Archaeology, University of Oslo, Museum of Cultural History, Norway) - Ljungkvist, John (Department of Archaeology and Ancient History, University of Uppsala, Sweden)

Format: Regular session

The session is focusing on the dialogue between theories, methods and models for analyzing processes of urbanization in a European perspective.

One focus point is the characteristics and processes, that on the empirical background of archaeology can be registered in the gap between localities with pre-urban features and the regular urban settlements. Another focus point is the relationship between the town and the surrounding society. Here attention is drawn to the early urbanization as setting for concentration of fundamental functions in society (e.g. law, trade and religion). These functions might operate within international networks (e.g. European trade systems and religion) as well as in local relations, that supports the shaping of urban environments.

We welcome papers with a microscale starting point in an archaeological case as well as in larger, comprehensive studies, that addresses the theme from an overall and macroscale perspective. Obvious themes might, besides the theoretical and methodological perspectives, be founded in both "bottom-up" as well as "top-down" processes.

The intention is to explore new and varied approaches to early urbanism and to present contributions that spread widely in time and space, i.e. across Europe in the period c. AD 200-1200.

Confirmed speakers:

Dr Manuel Fernández-Götz, School of History, Classics and Archaeology, University of Edinburgh, Scotland.

Associate Professor, Søren Munch Kristiansen, Department of Geoscience, School of Culture and Society - Centre for Urban Network Evolutions (UrbNet) Aarhus University, Denmark.

ABSTRACTS

01

FROM THE CENTRAL SPACES OF THE IRON AGE TO THE CITIES OF THE MIDDLE AGES

Author(s): Runge, Mads (Odense City Museums, Denmark)

Presentation Format: Oral

The earliest "wave of urbanization" in South Scandinavia is seen at the emporiums, which were established as continentally orientated phenomena during the late Iron Age. Later, the next generation of cities evolved and replaced a system of preurban central places. How this development took place is still in many ways an open question in archaeology and history. Recent research indicates a multi faceted development, combining elements of bottom-up-processes, grounded in the relations between the local hinterland and the early town, as well as top-down-controlled elements.

In a new interdisciplinary project, the complex development from the central spaces of the Iron Age to the cities of the Middle Ages is analyzed. The project incorporates the Danish cities Odense and Aalborg as cases within the temporal frame AD 400-1100. The project combines a landscape analytical and context-based approach with detailed studies of artefacts as well as structures of settlements, metal rich sites, cult sites, fortification, infrastructure and other fundamental elements of society. The data includes the traditional archaeological record as well as place names, topography, geology, historical documents and the natural sciences. Theoretically, the primary foundation is inspired from the social, geographical and economic sciences.

The paper is an introduction to the session with the interdisciplinary project functioning as a case study.

02 FAILED URBANIZATION OF THE EUROPEAN CHALCOLITHIC. TRYPILLIAN “MEGA-SITES” CONTEXTUALIZED

Author(s): Ohlrau, René (Kiel University, Graduate School „Human Development in Landscapes“) - Hofmann, Robert - Müller, Johannes (Kiel University, Institute for Pre- and Protohistoric Archaeology; Kiel University, CRC 1266: „Scales of Transformation - Human-Environmental Interaction in Prehistoric and Archaic Societies“)

Presentation Format: Oral

Trypillian “mega-sites” have experienced a renewed interest in recent years. The interpretation of these sites in terms of their urban character is however heavily disputed depending on the theoretical and disciplinary background of scholars. Even when the urbanity is refuted, their formation and abandonment depict an important step towards Eurasian urbanization.

Results of the past years allow us to trace the development and decline of “mega-sites” on a settlement and regional scale. Surveys on a variety of Trypillian sites, ranging from a few to hundreds of hectares revealed an overarching layout. This settlement pattern shows several levels of spatial organization reaching from neighborhoods to quarters, areas of craft production, and large plazas with special buildings comparable to the “mega-structure” of Nebelivka. While smaller sites have the same circo-radial layout, they seem to lack production areas, making them an interesting case to discuss rural-urban relations. A comparison of the structure and partitioning of larger and smaller sites revealed a “top-down” pattern which seems connected to synoecism. The social impact of population agglomerations becomes also apparent in the material culture. Here, naturalistic figurines depicting “the rise of the individual” and tokens referring to anonymous trust exchange systems give a glimpse at a developing urban way of life.

Besides agro-pastoral limitations and changing environments, failure of social integration might have ended further development in the mid-fourth millennium.

Various theoretical and methodological approaches towards urbanization processes, including non-eurocentric ones, will be discussed to put these sites into an overarching context.

03 COULD URBAN SETTLEMENTS SURVIVE (AND PROSPER) WITHOUT A HINTERLAND? THE CASE OF THE TRYPILLIA MEGA-SITES OF UKRAINE

Author(s): Gaydarska, Bissierka (Independent researcher) - Nebbia, Marco - Chapman, Jonh (Durham University)

Presentation Format: Oral

The Trypillia mega-sites of the Ukraine constitute the largest known settlements in 4th millennium BC Europe, if not the world. Investigations into the 10-km territory of the Nebelivka mega-site revealed a tiny number of coeval settlements and remarkably little off-site ceramic or lithic discard. This absence of evidence makes it hard to talk about a ‘hinterland’ of neighbouring sites which may have offered logistical support to a massive central place. Instead, we propose an alternative social model of annual rotational service and governance, carried out by extended social groups of common descent. Some members of these groups, totalling between 2,400 and 3,200 people, were living in cca 400 houses in Nebelivka on a more or less permanent basis. A substantial part of their annual subsistence was provided by the remaining members of the single group that was in charge/power on any particular year. These members were living in 10 to 13 small sites dotted across the 100 km catchment area of the mega-site. This model fits two important constraints on the number of houses built and burnt as established by geophysical survey of the whole mega-site and on the lack of any major ecological impact throughout the 150-year duration of the mega-site. The model shows that Trypillia mega-sites can indeed be considered as ‘urban’ but as a distinctive form of ‘urban’ space.

04 THE EMERGENCE OF LATE IRON AGE URBANISM: BOTTOM-UP PROCESSES OR TOP-DOWN PROJECTS?

Author(s): Fernández-Götz, Manuel (School of History, Classics and Archaeology)

Presentation Format: Oral

In large parts of Temperate Europe, the last centuries BC witnessed the emergence of large agglomerations, both open and fortified. Although most of the attention has been traditionally focused on the fortified oppida of the late 2nd and 1st centuries BC, new research emphasises the important role of large open settlements that in many cases preceded the oppida by several generations. There is increasing agreement that the development of urban sites needs to be understood within the wider context of their surrounding landscapes, the nucleation of settlement being the result of political and economic transformations and an increase in ‘social density’. In terms of power relations, there are differing interpretations about the driving forces behind these processes: were large centres the manifestation of bottom-up enterprises within social networks of a predominantly heterarchical nature, or should we envisage them as top-down projects directed by members of the social hierarchy? Can we observe multiple pathways to urbanisation, and differences between the processes that lead to the development of open vs. fortified sites? And were the push factors of a predominantly endogenous nature, or rather influenced by the increasing contacts with and pressure from the Mediterranean world? These questions will be addressed with reference to relevant case-studies that exemplify some of the core discussions in the field of Iron Age urban studies.

05 THE RELATIONSHIP BETWEEN MONUMENTAL PHASES OF THE FORA AND LEGAL STATUS OF THE ROMAN CITIES

Author(s): Canino, Dario (Universitat Autònoma de Barcelona - Sapienza Università di Roma)

Presentation Format: Oral

The construction or the monumentalization of a public area is closely related to the legal status of the settlement. The city, in fact, will always have the need to equip itself with different types of structures necessary for carrying out its administration: a series of buildings that are fundamental for the management not only of the city but also of the surrounding territory, that changes according to the statutory condition of the city.

The characteristics of the public and community spaces and, in particular, the types of structures contained in them, can be good indicators for the nature of a certain urban entity. For example, the public area of a *civitas stipendiaria* in a Roman province is certainly different from that of a *colonia* or of a *municipium*.

The cities with a privileged status, in fact, played a fundamental role for the whole territory which was part of their jurisdiction and, in these cities, the forum was a celebratory space of particular importance, in which, in the various monumental phases, some specific characters played a role in the construction or renovation of public buildings.

In these operations, the evergetism has often guaranteed the financing of numerous public works, which contributed, often in different times, to the achievement of an urban amenitas. The public monuments of the cities were, in fact, often built with the donations of wealthy citizens. These type of donations were connected with the desire for ostentation of economic power and social prestige and gave to the donors a strong political power at a local level.

It will be analyzed, through some significant examples of Roman cities in Italy and in Spain, the relationship between the legal status of the settlement, the monumentalization of the public areas and the patrons and the curators of the public works

06 NORTH SEA CENTERS: AN EVALUATION OF THE EFFECTS OF ACADEMIC INTERPRETATION ON UNDERSTANDING OF THE SCANDINAVIAN 'CENTRAL PLACES'

Author(s): Maddox, Timmis (Independent)

Presentation Format: Oral

Over the past forty years, the cultural landscape of Pre-Christian Scandinavia has become increasingly accessible, allowing archaeologists to better understand a part of Scandinavian history which had previously depended on unreliable texts. This is due to the discovery of large prehistoric settlements dating to the Late Roman/Germanic Iron Ages (AD 200-AD 800). Yet despite the opportunity which these sites represent, archaeological interpretation has remained limited. This is reflected by their varying interpretations, which are summarily lumped under the overarching term of 'central places'. Not only has this made the term 'central place' vague, but this also emphasizes a lack of understanding of how these sites were 'central' to wider society. For example, Morten Axboe, Birgitta Hårdh, and Lotte Hedeager respectively argue for administrative, economic, and social definitions of centrality. While a central place need not be limited to one form of centrality, these arguments represent a limited understanding of the core aspects which drove these settlements. What elements drove their emergence and further development? How were these settlements central to the cultural landscape of Iron Age Scandinavia? Urban definitions are also a constant issue for these sites, as scholars debate over whether or not these settlements represented examples of early urban centers. Using the neutral term 'focal settlement' this study evaluates the history of academic research into the Scandinavian 'central places'. By investigating how interpretations of centrality and urbanism have affected understanding of the focal settlements and then juxtaposing them with the Late La Tène oppida and Early Medieval emporia, this study establishes a general interpretation characterizing them as urban centers which served a socio-administrative centrality in Iron Age Scandinavia. Representing prehistoric examples of urbanism for their cultural context, the focal settlements functioned towards instituting and maintaining elite-driven collective identities, establishing themselves as the first centers of Iron Age Scandinavia.

07 THE PALACE AND THE VILLAGE - STRUCTURES AND ACTIVITIES IN GAMLA UPPSALA

Author(s): Ljungkvist, John (Dept. of Archaeology & Ancient history)

Presentation Format: Oral

The character of central places and proto-urbanity have been discussed for decades. Perhaps it is particularly hard to define some of the very large inland sites in Scandinavia with a pre Viking origin. Places like Uppåkra, Gudme, Sorte Muld and Gamla Uppsala are larger, richer, and more monumental sites than their surroundings. They have a completely different settlement layout and landscape placement than later coastal sites such as Birka, Ribe or Hedeby, all defined as either urban, proto urban, as emporia etc. But these old places are all not only royal residences or cult places, they filled a specific roles in their societies that could involve a royal presence, law, religion, military aspects, as regional assemblies and symbols. Finally they could have filled some of the economic roles of the emporia.

This paper is based on a very basic question surrounding a large inland sites. What did people do in Gamla Uppsala? This is an almost ridiculous question, but it has actually been hard to specify the character of the material culture of this site beyond the rich finds and monuments. New investigations makes it possible to discuss its settlement patterns, the diversity and intensity of crafts, and activities set in relation to sites in the surrounding landscape. Gamla Uppsala represents in some ways the idea of the pre medieval

manor or village (although very large) but there is also evidence for an ambition to create something different compared to other rural settlements. That includes not only the construction of the famous great mounds and halls. It also involves concentrating a number of workshops in the palace area, evidence of deviant agrarian activities, a peculiar village structure and not the least the evidence of spectacular rituals and peculiar finds that signal international contacts and a taste for special foodstuff.

08 CENTRAL PLACE OG TRADING PLACE? – TRAJECTORIES FOR UNDERSTANDING THE EARLY HISTORY OF DANISH TOWNS

Author(s): Sovso, Morten (Museum of Southwest Jutland)

Presentation Format: Oral

By c. 1200, a network of (mostly) small towns covered the Kingdom of Denmark spaced at c. 30-50 km intervals across the diverse landscapes of Jutland, Funen, Zealand, Scania, Halland and Blekinge.

The urbanization process behind this apparently homogeneous picture has been a matter of debate since Hugo Matthiessen's classic works of the 1920's: *Torv og Hærstræde* (1922) and *Middelalderlige Byer* (1927) applying a Darwinist, evolutionary view emphasizing gradual development and trade as the most important factors behind town growth.

A contrasting view was presented in Anders Andrén's *Den urbana Scenan* (1985) suggesting towns were something new: royal foundations propagating ideology in the form of Christian Kingship and economic control through taxation.

In different shapes and forms, these two contrasting stances are embedded in most urbanization discussions. Including the more recent ones aiming at sociological questions like identity, ethnicity and gender.

In the paper, the four medieval towns on the West coast of Jutland: Ribe, Tønder, Varde and Ringkøbing will be investigated. It will be argued, that all four of them are rooted in power structures that can be tracked deep into the first millennium.

Between 700 and 1200 they developed in very different ways. Ribe was an important emporium later to become the centre of a diocese. A result of a double role as both a "trading place" and a "central place". The other, smaller towns do not seem to go back to before 1050 and more closely fit a "central place" model.

09 PROSPEROUS TOWNS! EARLY COASTAL URBANISATION IN WESTERN SCANDINAVIA AD 800-1200

Author(s): Iversen, Frode (Museum of Cultural History University of Oslo)

Presentation Format: Oral

Compared to Europe, the degree of urbanisation in Scandinavia was low, particularly in Norway. During the Viking-Age (800-1050) separate trade laws, *Bjarkøyretter* developed and towns became separated from the rural jurisdiction and obtained their own laws and courts ("mót"), defining urban space. Beyond the town boundary ("takmark"), rural law ("heraðs rett") applied.

The saga phrase 'setja kaupstad' may indicate when an existing market or 'embryo town' became a judicial entity and achieved formal trading rights, and hence changed from a central place to an urban space. Around 1150-75, the coastal land of Norway is described as a 'Decapolis', an area with ten towns, traditionally identified as Nidaros, Bergen, Oslo, Borg, Tønsberg and Konghelle, together with Stavanger, Veøy, Skien and Kaupanger in Sogn. By the end of the Middle Ages there were only 16 towns in Norway, compared to more than a hundred in Denmark and 40-50 in Sweden.

The Norwegian kings seem to have had a relatively stronger grip on trade and towns compared to their European counterparts. There were few towns, and most of them were subordinated to the king. In this paper we will investigate the factors behind the prosperous royal towns emphasising pre-urban ownership of land, early assembly site-functions, elite-estate and production sites and the role of archaeological monuments in the development from central space to urban space.

10 FAILED TOWNS IN WESTERN SCANDINAVIAN AD 800-1200

Author(s): Loftsgarden, Kjetil (University of Oslo, Museum of Cultural History)

Presentation Format: Oral

This paper explores local, regional and international factors for the development from central space to urban place in western Scandinavian emphasising the role of inland resources and exchange between the inland regions and the coastal areas, c. AD 800-1200, and why some towns failed while others succeeded.

Iron production in the western Scandinavian inland was on a massive scale in the late Viking Age and early Middle Ages and exceed both regional and national demands. Iron did not only constitute a necessary commodity for regions with little iron production, such as the coastal areas of eastern Norway and large parts of western Norway, but played also a significant role in international trade, especially towards Denmark. As such, the inland production of Iron was important for trade and export and played a substantial role in the development of complex economic networks of this period.

The growing importance of iron as well as other inland resources such as reindeer hunting meant that the fjords became central places, and some places developed to urban places, like Borgund, Kaupanger and Veøy. However, none of these places lasted as medieval towns. In this paper we examine how cheap Swedish blast furnace iron and resource depletion (reindeer), combined with new stock fish trade-routes directly from Northern Norway to the town of Bergen, changed the centrality of the fjord-bound urban places.

11 FEUDAL POWER AND THE EMANCIPATION OF THE MERCHANT IN FLANDERS AS DRIVING FORCE FOR THE URBAN REVOLUTION, 850-1200

Author(s): Tys, Dries (Vrije Universiteit Brussel)

Presentation Format: Oral

The development of feudal power in the post-Carolingian world had a lasting impact on the medieval landscape, not only in establishing estates and manors but also by emancipating the already existing merchant class, at least in Flanders between the second half of the 9th and the 13th century. Already Verhulst, followed by Loveluck and Tys noticed how the urban revolution in Europe only initiated properly after the feudal investment in portus towns after the era of the Carolingian emporia (for instance in Bruges, Ghent, Ypres, Lille and other towns). Today, a new assessment of the reproduction strategy of the important 10th to 12th century counts of Flanders, raises the hypothesis that by investing in infrastructure for trade, the feudal lord did indeed draw the card of commercialism to strengthen his princely position. This goes quite direct against Pirennes idea of the importance of the liberal merchant overpowering the conservative feudal lords. One could even say that the counts of Flanders valued the dynamic social and economical power of early-medieval assembly and that by reorganising assembly in the feudal age, they turned this into their own profit, thus giving the final stimulus towards the rise of the succesfull towns of late-medieval Flanders.

12 THE SETTLEMENT(S) OF WISKIAUTEN/MOKHOVOYE - VIKING AGE TRADING PORT OR ONLY PERIPHERY?

Author(s): Sirkin, Annika (Centre for Baltic and Scandinavian Archaeology, Schleswig; Academy of Sciences and Literature Mainz)

Presentation Format: Oral

In 1865 a rich Viking Age/Early Medieval graveyard with Scandinavian and indigenous Prussian grave goods and various burial traditions was found near the village Wiskiauten in former East Prussia, nowadays Mokhovoye, Kaliningrad district, Russia. It is situated on the Sambian Peninsula, about 3 km from the Baltic coast. Ever since, an implied settlement which is supposed to belong to that graveyard was interpreted as a "colony" or a port of trade in the silver trade routes, comparable to e.g. Birka in Sweden or Hedeby in Germany. In 2005-2011 multifarious traces of small settlements from Neolithic up to Medieval time were discovered around the graveyard.

This paper will provide interim results from my PhD thesis on the comprehensive evaluation of the settlement excavations in Wiskiauten, perhaps the first large-scale examination of settlement structures in the surrounding of a supposed Central Place. I would like to discuss why – without concrete evidence – a port of trade is nevertheless expected to have existed in the vicinity. On that basis, my aim is to create a model of Early Medieval settlement structures in former East Prussia. Subsequently, I want to unveil a new picture of an area that is still almost detached from general interpretations of European scale processes in early Medieval Ages.

13 THE EMERGENCE OF A NEW TOWN IN NO-MAN'S-LAND. A CASE STUDY OF ENKÖPING IN CENTRAL SWEDEN

Author(s): Lagerstedt, Anna - Gustafsson, Stefan (Arkeologikonsult)

Presentation Format: Oral

The town Enköping was founded during the late 11th century in a place that lack previous indication of having central place function or the place of high ranking settlements.

The distribution of large burial mounds, early churches, place name indicating centrality and the concentration of prehistoric cemeteries indicate that the town was founded on a new place in the social landscape, in a place between several magnate farms and on the border between two administrative districts.

At the time of the foundation of Enköping the Swedish Crown had a weak position with regional limited power and it is not likely that the town was founded by the King. Later, during the 12th century, the town was an important place for the church in the province of Uppland. However, the church establishment seems to have been preceded by the laying of regulated urban settlement with long, narrow plots related to a market street.

We suggest, as an alternative, that the earliest urbanization in Enköping was the result of a need for a marketplace for the local aristocracy. We also want to emphasize the importance of identifying several periods and processes of urbanization in the Middle Ages, thus not seeing urbanization as a linear process. Early urbanization may differ from recent developments with different groups that driving change.

The starting point of this study is a recent conducted and extensive archaeological excavation in the medieval town of Enköping. We want to investigate, on a micro level, how these remains can provide a perspective on the earliest urbanization. Who were the people that moved into the first households? How and when does an urban identity emerge? What type of interactions did the people of Enköping have with the rest of Sweden and Europe in the oldest phases of the town?

14 THE BEGINNING OF URBANISM IN ESTONIA (CA. 1200-1300): THE EXAMPLE OF TARTU

Author(s): Haak, Arvi (Tartu City Museum; University of Tartu, Department of Archaeology)

Presentation Format: Oral

The development of medieval town of Tartu (Germ. Dorpat) has been seen either as a gradual development from the prehistoric fort-and-settlement system at the same site, or a 13th-century „planted“ town of settlers of German background, only loosely connected to former habitation. After a brief overview on the elaboration of the concept of 13th-century urbanism in Estonia, and the prelude outlining the main developments in Tartu prior to the early 13th-century crusade (1208-1227), the presentation will concentrate on the model formation for the urban development in Tartu. What sources have proved most valuable in reconstructing the urban beginnings, and how have facts and models been integrated?

Using the existing archaeological data as a starting point, the presentation aims at establishing a time frame for several “top-down” processes central to the “planted” town concept. This leads to an attempt to sketch a development model for Tartu between 1225 and ca 1300, and address the earlier presented idea of replanning the urban space within the first 50-75 years of development. According to my research, the number of 13th-century archaeological features is much smaller than previously suggested, referring to modest rather than rapid urban development. The existence of several “colonial” features is clearly visible, but of equal importance is the discrepancy between any ideal picture, and the actual development, which was as much influenced by local actors as of particular natural and topographic conditions. Yet the existing archaeological and archival data is too scanty for reconstructions based primarily on that data. Thus, model-based approaches could be used to integrate this information into a better understanding of the urban development in Tartu.

15 MULTI-SCALAR APPROACH FOR HIGH-DEFINITION CENTRAL PLACE AND URBAN SPACE ANALYSIS ACROSS DIFFERENT ENVIRONMENTS: REMOTE SENSING, GEOPHYSICS AND SOIL MICROMORPHOLOGY

Author(s): Kristiansen, Søren (Aarhus University, Department of Geoscience & Centre for Urban Network Evolution) - Lichtenberger, Achim (Westfälische Wilhelms-Universität Münster; Institut für Klassische Archäologie und Christliche Archäologie/Archäologisches Museum) - Stott, David (Aarhus University, Department of Geoscience) - Sulas, Federica - Raja, Rubina (Aarhus University, Centre for Urban Network Evolution, Department of Culture and Society) - Ljungberg, Thomas (Aarhus University, Department of Geoscience)

Presentation Format: Oral

Remote sensing and aerial photography are now routinely applied for mapping and characterising archaeological sites, while geophysical investigations and geoarchaeological methods have proven useful to understand contextual stratigraphies within a site. However, systematic investigations of ancient urban landscapes remain challenging due to modern disturbances, the multi-period use of many urban archaeological sites and the fact that early central/urban places may be scattered over waste areas in present-day hinterlands. Drawing from recent and ongoing research, this paper illustrates how a multi-scalar analysis efficiently can refine understandings of complex urban sequences across very different environments and contexts. In Denmark, combined geophysical investigations and airborne laser scanning (LiDAR) data is now transforming our ability to detect human activities testifying Iron Age transition from central places to urban spaces. At the ancient city of Jerash (Jordan), LiDAR, aerial photography, on-ground excavation and geophysical data combined with GIS software have created a new city map of the multi-period city. Zooming into the microscale, integrated soil geochemical mapping and micromorphology have detailed household activities and use of space within early coastal settlement at Unguja Ukuu, Zanzibar. Evaluated together, these case studies show how an approach with spatial resolution from km to micrometer scales holds unique potential for developing improved understanding of the complex urban soil archives in Europe and beyond.

512 EXPLORING THE PRESENTATION AND INTERPRETATION OF PREHISTORY IN MUSEUM DISPLAYS

Theme: Museums and the challenges of archaeological outreach in the 21st century

Organisers: McDowall, Felicity (Department of Archaeology, Durham University; Centre for Visual Arts and Culture, Durham University) - Beusing, Ruth (Römisch-Germanische Kommission des Deutschen Archäologischen Instituts) - Roberts, Benjamin (Department of Archaeology, Durham University)

Format: Regular session

This symposium explores how past peoples either without written records or who are predominantly known only through archaeology are represented within museum displays. It seeks to understand how different museum spaces, collections, display techniques and narratives can influence audience engagement. The more distant and fragmentary the past is, the more difficult it can be to present in an engaging and relatable manner. Advances in archaeology and archaeological science provide increasingly complex perspectives on the deep past which museums are then challenged to re-interpret as narratives for their visitors. Thus museums face both interpretational and practical issues in how they present prehistoric and protohistoric groups to the public.

We welcome papers that analyse museum displays and investigate how these shape visitor perceptions and challenge preconceptions. Papers are encouraged to evaluate different aspects of visitor engagement with these museum displays and interrogate the advantages and disadvantages of such methodologies. We are also interested in papers that critically approach the representation of past communities, deconstructing and assessing the impact of representations on the visiting public. We hope that this symposium can facilitate a constructive debate on innovative approaches to representing prehistoric past peoples.

ABSTRACTS

01 “CAVEMEN BEFORE CIVILIZATION”: A METHODOLOGY FOR UNDERSTANDING VISITOR PERCEPTIONS AND ENGAGEMENTS WITH BRITISH PREHISTORY DISPLAYS

Author(s): McDowall, Felicity (Archaeology Department, Durham University; Centre for Visual Arts and Culture, Durham)

Presentation Format: Oral

Museums play an important role in presenting prehistory to the public, yet this period is often perceived by visitors as primitive, irrelevant and uninteresting. Museums are thus faced with the daunting task of presenting the complex narratives of prehistory in a display format that is both accessible and engaging to a diverse public with differing background knowledge. It is therefore essential that museums have an understanding of how the public perceives prehistory, what visitors find interesting about it and what common misconceptions there are concerning the period. As well as an understanding of how visitors respond to particular narrative themes and styles of display. This paper will outline how this can be achieved by first highlighting general trends in how British museums present prehistory based on my large-scale analysis of 75 prehistory displays from Orkney to Penzance.

This paper will then demonstrate two methods of visitor evaluation and how this integrated approach can provide a valuable insight into public perceptions of and consumption of prehistory. It will present three case studies, the British Museum, Stonehenge Visitor Centre and North Lincolnshire Museum to illustrate how undertaking tracking surveys in combination with questionnaires can facilitate a deeper understanding of visitor engagement. The tracking surveys are highly valuable as they produce a wealth of quantitative data that provides an unbiased insight into how prehistory exhibitions are used and which displays are most and least popular to visitors. Whilst, the questionnaires produce more in-depth qualitative data about what visitors understand of prehistory prior to viewing the displays and after viewing them. This methodology has produced data from 300 visitors which highlights the different ways that visitors engage with prehistory interpretation and demonstrates how display narratives and gallery layout in particular can have a massive impact on visitor engagements with and understanding of prehistory.

02 CURATING ‘CELTS’: LESSONS FROM THE BRITISH MUSEUM EXHIBITION

Author(s): Farley, Julia (British Museum)

Presentation Format: Oral

This paper will critically reflect on the process of curating the British Museum’s exhibition ‘Celts: Art and Identity’ (25th September 2015 – 31st January 2016), organised in partnership with National Museums Scotland. It will focus on how the curators sought to challenge, but also to build on, established narratives and preconceptions, by telling stories through objects, texts, images, and 3D design, and how the final exhibition was received.

Early-stage focus groups asked members of the public for their responses to the word ‘Celts’, and ‘Celtic’. This helped to shape the structure and narrative of the exhibition. Rather than focusing on the negative (“There’s no such people as the Celts”, “It’s more complicated than that”), the exhibition sought to tell a compelling story of how the meaning of the name ‘Celt’ has changed over the last 2500 years. The aim was to capture the public’s imagination by presenting recent academic work in a new light, re-invigorating debate about national identities in the UK and beyond.

The paper will conclude with an evaluation of the press reaction to the exhibition, and impact on visitors, based on the British Museum’s summative evaluations. Was the exhibition successful in its aims? What worked well, and what could have been improved?

03 BANISHING THE ‘CELTS’ FROM THE ‘KELTENWELT AM GLAUBERG’?

Author(s): Beusing, Ruth (RGK - Romano-Germanic Commission DAI)

Presentation Format: Oral

Research about the Celts has been carried out in the academic world and beyond since the 16th century, and the concept of a Celtic people has found acceptance in the public.

During the last 20 years, this long tradition has led to various differing views on ‘the Celts’ and on the sources that brought them to our attention - not only in archaeology but also in other disciplines. Moreover, the relatively young discipline of archaeogenetics has found public interest by claiming to provide new answers on the origin and distribution of ‘the Celts’.

In Great Britain some of these new concepts have recently been summarized in the national exhibition ‘Celts – art and identity’. But on the Continent alternative views on the omnipresent idea of a ‘Celtic’ origin in Central Europe and their expansion in the later Iron Age have not yet been brought to public awareness.

In 2018 a small exhibition in the 'Keltenwelt am Glauberg' tries to illuminate research history, theories and new scientific research on the 'Celts' in a way suitable for the general public. While accepting that the term 'Celts' will probably not soon (if not never) be banished from public preconception, it tries to dissect its components and follow up the history of reception from the 16th century to modern times. The demand for this kind of exhibition at the 'Keltenwelt' arose from the frequent questions of people visiting the permanent exhibition that deeply resonate on the connection between the different preconceptions of 'Celts'.

The paper will present the concept and layout of the exhibition at the 'Keltenwelt am Glauberg', and present the first results of a simultaneous visitor evaluation.

04 PRESENTING DEEP HISTORY AT THE BRITISH MUSEUM

Author(s): Fletcher, Alexandra - Scott, Rebecca (The British Museum)

Presentation Format: Oral

This paper will explore how the British Museum has presented and translated objects that reflect human experience, adaptation and identities in the deep past and reflect on how well such displays have reflected prehistoric life-ways. The collection of the British Museum spans 2.5 million years of global history but although this includes substantial prehistoric collections, few of these, in particular the Palaeolithic collections, are currently on display. The institution faces specific contextual challenges in deciding how to display the deep history of a global collection, particularly as other prehistoric collections are often presented in contexts that are specialised (regional or period specific), or conceptually separated from the broader human past (museums of anthropology, human evolution, or natural history). The challenges of displaying the deep human past can therefore be met in very different ways. Through two case studies of British Museum temporary displays relating to Europe and the Middle East (the 850,000 year old hominin footprints from Happisburgh and the 9500 year old plastered Pre-Pottery Neolithic B skull from Jericho) we will question public appetite for, and understanding of, deep history and explore how the Museum has approached communicating the interdisciplinary nature of research into deep history to public audiences.

05 CONVERSATIONS WITH MAGIC STONES

Author(s): Anderson-Whymark, Hugo (National Museums Scotland) - Edmonds, Mark (University of York)

Presentation Format: Oral

Conversations with Magic Stones was a three year project devoted to the prehistoric stone tools of Orkney, and to similar objects from around the world that have found their way into the region over the years. Taking in material from the Palaeolithic to the Bronze Age, the project also explored the social history of collecting in Orkney, tracking how stone tools have been collecting people from prehistory down to the present. In this paper, we discuss how we developed the research as a resource for a variety of different communities. These ranged from a large website (orkneystonetools.org.uk) to exhibitions in art galleries and museums, public talks, and close collaboration with local schools. The project even produced it's own Top Trumps style card pack - entitled ROCK STARS - which was given away to schools across the region. A key concern throughout was that we should explore the biographies of particular objects and assemblages right through to the present. Important in their own right, these more recent histories also created a context for reflection, about how stone tools were caught up in people's lives in prehistory. In working across different settings, from museums and galleries to the classroom and the kitchen table, we found that the direct handling of material had a powerful influence on people's responses to even the simplest of tools. The time spent handling objects also opened up a space for conversation, for the exchange of ideas about the entanglement of people and things.

06 DIFFERENT APPROACHES TO EXPERIENCING PREHISTORY IN EUROPEAN MUSEUMS

Author(s): Henson, Donald (University of York)

Presentation Format: Oral

This talk is based on my PhD research, looking at the narratives used to convey the Mesolithic to the public. I will present two contrasting approaches to presenting the Mesolithic to the public by museums. One the one hand we can present a personal story to engage visitors in past people. On the other hand we can try to convey a sensory experience of the past. Each of these focuses on one aspect of narrative, one on characters we empathise with and the other on a mimetic storyworld we can transport our minds into. The museums studied were distributed across Britain and the rest of northern Europe from Sweden to the Netherlands. A variety of approaches was seen to the introduction of characters and presentation of sensory experience. Personification of displays varied from including people by showing their absence, having individuals placed within displays, by having characters 'speak' directly to the visitor, by having named characters as part of the interpretive labelling and by developing an explicit character-led narrative to go alongside the exhibition. Sensory engagement included the simulation of smells or provision of sound, the creation of simulated natural environments in both indoor and outdoor settings, and the exploitation of real natural environments as part of the visitor experience. I will attempt to say why I think some of these approaches work better than others.

07 VIEWING THE PALAEOLOGIC: BEYOND THE GLASS CEILING

Author(s): Beresford, Jade (University of Southampton)

Presentation Format: Oral

Viewing prehistory is only possible because we have been taught how to look and learn.

This paper explores how different museum spaces, collections and display techniques are used to create, maintain and challenge androcentric narratives about the prehistoric past. Displays are not passive mediums for the dissemination of 'scientific' knowledge; images rather, actively contribute to the knowledge cycle that frames both public and professional imagination. Through a comparative museological analysis I demonstrate that the problem of gender stereo-typing in the reconstruction of prehistoric behaviours will not change if we simply revisit the same cannon of highly formulaic scenarios and refuse to make explicit the socio-historic processes of knowledge production in contemporary society.

I argue there is more to Palaeolithic peoples and their life patterns than stone tools. The time has come to present the driving factor of evolution not in terms of material or typological development, rather a focus on emotions. Visual displays should place emphasis on the importance of music, sound, dance, performance and art as a means of harnessing emotion. What remains to be visualised is a sense of social interaction and intimacy between the sexes and providing a sensory experience for the visitor. An understanding and appreciation of emotion within a 'dwelling perspective' effectively portrays males and females as equal participants in the process of evolution. This provides archaeologists with the theoretical space to study the inter-related activities and relations between individuals, matter, substances and materials. The approach is reinforced by the utilisation of cognitive models that express social interactivity, shared parenting and object attachment as key factors in the evolution of our species. I close by suggesting that the museum is a social instrument for change and that the only way to challenge old stories is to create new ones.

08 WHAT KIND OF PREHISTORY PRESENT TO THE PUBLIC MADRID'S ARCHAEOLOGICAL MUSEUMS?

Author(s): Aguado, Maria (Universidad Autónoma Madrid)

Presentation Format: Oral

For a long time now, archaeological museums have been understood as educational spaces for spreading the scientific knowledge we have about the oldest history and Prehistory. But... how are those knowledges presented to the public? We propose for this meeting a reflection about the orientation of the museological display in the main museums of Madrid (the National Archaeological Museum, the Community of Madrid Museum and the municipal one, called "Museum of the Origins") that we will try to expand in the future to others of different regions of Spain and Europe. For now, we will check if the Prehistory they speak about in their rooms focuses on the chronological evolution or on the structural study of the different societies; whether it is local or universal and what kind of relationship between those three spatial levels (local, regional and national) is presented; whether everyday life predominates and all social groups are protagonists or, on the contrary, it follows a discourse of rank and focuses on the evolution of the elites; whether women and children appear, whether transcultural relations are explained or not, as well as the causes of changes and evolution, etc. One of the main responsibilities of our museums is to train non-specialist citizens, to help them understand society. Therefore, the way in which their origins are explained is very important: it directly influences their vision of their history and their present. Being aware of this will allow us to improve (even homologate) the various discourses present in archaeological museums.

09 WHAT WE FEEL WHEN WE SEE AN ARTIFACT: PREHISTORY EXHIBITION IN MODERN RUSSIA

Author(s): Sevastyanov, Nikolay (Saint Petersburg State University) - Kholkina, Margarita (A. P. Karpinsky Russian Geological Research Institute - VSEGEI)

Presentation Format: Oral

The archaeological museum is the most important channel of the cultural communication connecting archaeology with society. Unfortunately, one of the main problems of the displays in archaeological museums in Russia is their little appeal to public. Among the reasons of the current situation is the emerging trend to deny social reconstruction due to their unauthenticity, lack of artistic aspect and exceedingly rare involvement of the experts of other domains.

During our research we observed different methods of prehistory archaeological display organization that might catch the interest of general public. We have also analyzed modern archaeological exhibitions and defined their strengths and weaknesses. The aim of our research was to identify the meaning of the archaeological artifact not for a specialist but for an ordinary visitor in today's social and cultural context. Based on exhibition facilities we try to show the artifact's properties that attract visitors' attention such as its scarcely imaginable antiquity, the presence of "encoded" information that might shed a light upon the historical past, the connection with the modern culture or its absence, and, finally, its esthetic attractiveness. The last-named quality is particularly important when displaying not only art objects (which speak for themselves) but also the "ordinary" archaeological material.

The social aspect of the research brought forward the decreasing visitors' interest in artifacts' amassment on display and in exhibition halls. That is why the individual approach, that takes into consideration the archaeological excavation context, colour, shape and presumable use of the artifact, to the way every single artifact is displayed becomes crucial.

10 WITHOUT THE BURDEN OF CLASSICAL FOLDS. PREHISTORIC FIGURINES IN GREEK ARCHAEOLOGICAL MUSEUMS

Author(s): Chourmouziadi, Anastasia (University of the Aegean)

Presentation Format: Oral

Greek archaeological museums had never any innocence to lose. They were founded to support ideological arguments concerning Greek national identity; and that's what they have been doing for 150 years, promoting, in a simple and unsophisticated way, the masterpieces of classical art. Prehistoric exhibits, on the other hand, due to their marginal role, have been the fruitful ground for some interesting, though quite limited, exhibition experimentation, since the 70's. After almost half a century, however, prehistoric antiquities remain museologically marginal in that they repeat outdated exhibition practices and systematically ignore the enhanced and constantly evolving relevant archaeological discourse.

Focusing on the museal presentation of prehistoric figurines, this paper examines the poor and uninspired contemporary prehistoric exhibits. Rather than conveniently put the blame on government's nationalistic priorities, I attempt to discuss the efforts of prehistorians and museum people to find some social relevance and, accordingly, try some innovative and interesting exhibition practices for prehistoric antiquities; whether, in other words, we have attempted to constitute theoretical frameworks and elaborate methodologies in order to resist formalistic stereotypes, relinquish dubious cultural classifications, and discuss with the "others" the significance of these uncanny things. I argue that figurines, as a part of the archaeological material record characterized by significant interpretative ambiguity, albeit evocative of emotion and "advantageous" museologically, can help us make use of the dynamic potential that a historic narrative, free from gilded nationalistic presumptions, can offer.

11 DIGITAL TOOLS TO LEARN AND ENGAGE: ARCHAEOLOGICAL EXHIBITIONS' FUTURE IMAGINED IN THE VIRTUAL ERA

Author(s): Cetin, Seyda (Koc University's Research Center for Anatolian Civilizations)

Presentation Format: Oral

In recent years, thanks to the immersive and interactive capabilities of digital media, artificial intelligence (AI) and machine learning, mapping and geographic information systems, 3D modelling and Virtual Reality (VR) in museums, new opportunities emerged for a more direct understanding of the lives of early cultures. There is a need for greater co-operation and communication between all sectors in technology, archaeology, cultural heritage, research, museums and beyond. In an age that digital tools are widely used for research purposes, this paper will examine the interconnection between information (data) and transformation of knowledge by investigating digital display methods in exhibitions that use these two notions within the creation and re-interpretation processes. To investigate the opportunities this offers for alternative exhibition contexts, the article here presents one collaborative model for digital interpretation methods in an archaeological exhibition, rare in its exclusive focus on audience engagement by employing VR and AI technologies. The exhibition entitled "The Curious Case of Çatalhöyük" opened at the ANAMED Gallery in Istanbul, in 2017 presented the excavations at the UNESCO World Heritage List site of Çatalhöyük and the life in the Neolithic era. The interdisciplinary approach of the excavation project was reflected in exhibition displays with 3D printed replicas of selected finds, laser-scanned overviews of the mounds, as well as a data sculpture developed by employing machine learning algorithms. Moreover, a recreation of Çatalhöyük settlement in "Virtual Reality" was included in the exhibition aiming to create the feeling of "being then and there." Highlighting a number of key narration trends, this paper will explore digital interactive practices that seek to challenge conventional modes of exhibition methodologies to have a significant impact on the user experience and display approaches of future archaeological museums.

12 HANDS ON EXPERIENCE IN ARCHAEOLOGY MUSEUMS

Author(s): Erdem, Deniz (METU)

Presentation Format: Oral

The Middle East Technical University, Archaeology Museum is displaying artefacts gained through excavations that a university has conducted directly on its own campus and in the near vicinity. Exhibition of the Museum is dated to 5000 years before the present.

METU Archaeology Museum as a university museum aims to tell the history of the city, to both students and the rest of the people in the city. But in the world where everything changes rapidly, it is difficult to attract the attention of the younger generation. The presentation of the exhibitions in the form of hands on experience will attract more attention and motivate people come to the museum. In this sense, METU Museum developed projects to attract the interest of the young population. Specifically, the purpose of these projects is to promote the knowledge of archaeology, help them connect with the past communities and create awareness of cultural heritage. The participants of this project are students of age 12-15. In the scope of this study, background information as well as practical applications will be provided. Measurements and evaluations indicate that this type of studies make important changes in students' archaeology and past perception. In this presentation these practical applications will be introduced and their affects will be discussed.

13 NOT JUST ROCKS AND HAZELNUTS: DISPLAYING STAR CARR

Author(s): Joy, Jody (Prehistoric Society; University of Cambridge)

Presentation Format: Oral

The site of Star Carr in Yorkshire is one of the most important archaeological sites in Britain. Finds such as well-preserved bone tools and weapons and mysterious headdresses made from deer skulls and antler provide a unique insight into Mesolithic life 11,000 years ago. The site was first excavated in 1949 by Cambridge University professor Grahame Clarke and much of the material from the excavations came to the Museum of Archaeology and Anthropology (MAA).

How can we make prehistoric material, which is often small and brown, engaging and interesting to museum audiences and how can we cover the full complexity of Mesolithic life in a single exhibition? I will examine these questions and others in this presentation which discusses some of the challenges we encountered when curating an exhibition on Star Carr which opened at MAA in June 2018. Much of the discussion will centre on the Star Carr headdresses which, because we don't really know exactly what they were used for, proved a particular challenge to display. Were they ritual objects worn by shamans or hunting aids and how do we communicate these uncertainties to museum audiences who often prefer to be told facts rather than asked questions.

513 BRIDGING OCEANS AND THEORETICAL APPROACHES TO LITHIC ANALYSIS

Theme: Theories and methods in archaeological sciences

Organisers: Burke, Adrian Louis (Université de Montréal) - Riel-Salvatore, Julien (Université de Montréal)

Format: Regular session

Archaeologists who specialize in the analysis of stone tools and knapping debris have a wide array of methodologies available to them. These methods are combined, with greater or lesser success, with theoretical approaches in order to reconstruct and interpret the various roles that lithic technology has played in past societies. The purpose of this session is to compare, contrast, and, if possible, confront these different methodologies, and in particular the theoretical constructs that underpin them. We hope to assemble together researchers working in various parts of the world in order to show how different datasets can be analyzed using the same methodologies and theoretical approaches. We also expect to have examples of similar datasets (e.g. biface or blade technologies) that are analyzed using different methods and theories. Our intent is to show how lithic methodology and theory is expanding and diversifying on a global scale while at the same time identifying common threads that can allow researchers from diverse research backgrounds to speak a common lithic language, or at the very least translate their research into something that is mutually understandable and useful.

ABSTRACTS

01 RECONCILING EUROPEAN AND NORTH AMERICAN METHOD AND THEORY IN LITHIC ANALYSIS: THREE CASE STUDIES FROM THE PREHISTORY OF EASTERN CANADA

Author(s): Burke, Adrian (Université de Montréal)

Presentation Format: Oral

This paper will serve as a general introduction to the session. I present the advantages, and accompanying challenges, to a combined approach to lithic analysis that uses method and theory from European and North American traditions. Reconciling different approaches such as chaîne opératoire versus reduction stages can be difficult, but ultimately it provides a more complete interpretation of the organization of stone tool technology in the past. In this paper I will present three case studies in which European and North American methods of analysis have been applied to lithic assemblages from Eastern Canada for three different periods (Paleoindian, Archaic and Woodland) and three very different technologies. The purpose is to show how these different methodologies can be combined but also to show the challenges that some of the North American lithic technologies present in terms of technological analyses, and in particular for the application of the French technological approach. These difficulties come primarily from the fact that there are few formalized core technologies based on predetermination of debitage in North America, and none in northeastern North America with the possible exception of bifaces used as cores. I also address the larger theoretical questions that encompass these studies and which guide our interpretations whether it is in the form of technical systems, skill and gestures, or in terms of the role of these lithic technologies in the adaptive success of certain prehistoric groups.

02 VARIABILITY WITHIN MODE 2 TECHNOLOGY: EXPANDING CRITERIA FOR TECHNOLOGICAL CLASSIFICATION OF THE LOWER PALAEO-LITHIC OF WESTERN EUROPE AND SOUTH ASIA

Author(s): Srinivas, Akash (Indian Institute of Science Education and Research - IISER, Mohali)

Presentation Format: Oral

Various methods of lithic analysis have been developed and used in the understanding and interpretation of lithic techno-complexes through time – typological, technological, functional, reduction sequences, chaîne opératoire and others. Each method established

its own criteria for the classification and categorisation of techno-complexes. Recent developments, which favour a more holistic understanding of hominin behaviour and capacities, question previously established criteria for technological attribution, and command a reinvestigation into previously investigated and studied lithic assemblages. Until recently, simplistic typological criteria such as the presence/absence of bifaces, defined the technological attribution of lithic techno-complexes into a Mode 2 ascription. This study, by reinvestigating two distinct lithic techno-complexes of Western Europe (i.e. Isernia La Pineta, southern Italy) and South Asia (e.g. Mahadeo Piparia, Central India) respectively, seeks to address their technological characterisation and attribution through a more expansive database and along recently accepted criteria for technological attribution currently followed in Western Europe, Africa and the Levant. The study addresses the question of variability among Mode 2 techno-complexes along various parameters by subjecting the lithic assemblages of these two sites to technological and chaîne opératoire analyses, complementing their previous typological analysis, in order to reclassify them as Mode 2 assemblages, from their earlier Mode 1 attribution. By invoking a wide array of technological and behavioural parameters, this study will outline the importance of understanding the variability within, among and between Mode 2 techno-complexes, and the need to reinvestigate previously studied assemblages along expanded criteria for technological attribution.

03 BREAKING DOWN METHODOLOGICAL BARRIERS FOR THE STUDY OF THE MIDDLE PLEISTOCENE INDUSTRIES IN THE WESTERN SIDE OF EUROPE

Author(s): García-Medrano, Paula - Ashton, Nick (British Museum) - Moncel, Marie-Hélène (National Museum of Natural History) - Ollé, Andreu (Institut Català de Paleoecologia Humana i Evolució Social; Universitat Rovira i Virgili)

Presentation Format: Oral

The different criteria used to analyze and to categorize the results through the different research traditions make difficult to compare data. Although many technological approaches have been developed, there are still differences in method between the different countries in the study of the Middle Pleistocene industries in the Western side of Europe. The British research has been based on the typological system of Wymer or the morphometric system of Roe for the analysis and classification of handaxes, as well as on the simple description of shaping sequences developed by Newcomer and Wenban-Smith. In turn, the French traditions are mainly based on the typological view proposed by Bordes, on the complex approach of the chaîne opératoire, and on the techno-functional approach proposed by Boëda. Meanwhile, the Spanish tradition has been highly influenced by the French school, with significant methodological developments coming from the Logical Analytic System.

This work proposes a common method of analysis of the Acheulean technology to go beyond the local perspective and gain a regional point of view in the Western side of Europe. This requires a deep understanding of the underlying technology to identify the differences or similarities in processes and traditions of manufacture. The new methodology, applied in several sites of UK and France, is based on the selection of those technological attributes which give more information about the LCT and how they have been produced. Each tool will be analyzed as a unit and also divided in its three main morpho-potential sections: distal, medium and proximal parts. And, taking advantage of new technologies and combining the basic technological analysis with 3D models, we will to standardize the process of measurement and documentation of the pieces.

This methodological approach is the base of a Post-doctoral Marie Skłodowska Curie project, entitle The Western European Acheulean Project, (ID. 748316).

04 PATTERNS IN STONE: A COMPARATIVE FRAMEWORK OF INTRA-SITE SPATIAL PATTERNING

Author(s): Clark, Amy (The University of Oklahoma)

Presentation Format: Oral

Lithic artifacts present unique opportunities for study, since they are the most ubiquitous artifact in the archaeological record, spanning from the earliest hominids to the late-Neolithic periods. Although faunal and organic remains can reveal additional dimensions of behavior, stone artifacts are found at nearly every site. Therefore, a focus on lithic tools provides the most widely applicable focus for comparative studies. Of course, stone tool typologies have been the predominant focus of comparative frameworks, particularly for the most ancient assemblages. Since the development of lithic typologies, many alternate and complimentary methods of studying stone tools have been proposed and adopted. Here, a new method for analyzing the spatial patterning of lithic artifacts is presented. This method builds on French and American traditions of stone tool analysis, uniting lithic refitting with quantitative methods. This method was designed to be utilized in a comparative framework, so that the spatial patterning of lithic artifacts at many different sites can be directly compared. Therefore, the analysis does not incorporate the existence of fire features or other structures that are traditionally utilized in intra-site spatial analyses. Instead, it relies on lithic refitting and the spatial clustering of lithic artifacts. The results of this analysis both rely on and contribute to theoretical approaches that explain how lithics are knapped, selected, moved, and utilized within archaeological sites.

05 MAKING IT WORK: INTEGRATING EUROPEAN AND NORTH AMERICAN APPROACHES TO RECONSTRUCT PALEOLITHIC LIFEWAYS IN NW ITALY

Author(s): Riel-Salvatore, Julien (Université de Montréal)

Presentation Format: Oral

While 'technological' perspectives from Europe and North America are often portrayed as fundamentally at odds methodologically and conceptually, the reality is that they often address different elements of prehistoric lifeways. This, and the fact that the manner of deriving research questions often proceeds along distinct pathways on both sides of the Atlantic, often creates the appearance of irreconcilable differences. In practice, however, this nominal gap can productively be bridged to yield a more holistic view of life in the past while helping develop better strategies for lithic analysis. This paper draws on my experience of over 15 years of conducting collaborative research in Italy, first as a student later as a project director, at three sites to underscore how this process can unfold and be integrated into an effective workflow to which Italian and Canadian students can be profitably be exposed. Drawing on examples from the Upper Paleolithic sequence of Caverna delle Arene Candide and the Middle Paleolithic sequence of Riparo Bombrini, this analysis highlights some of the particular but resolvable theoretical challenges faced in integrating approaches rooted in different regional research traditions and underscores the empirical 'added value' that results from these efforts, especially in the medium and long-terms, once the strategies have been field tested. In particular, we highlight how combining chaîne opératoire and techno-economic approaches to ones focused on lithic technological organization and mobility strategies helps shows the dynamism of past socio-ecological systems and better explain some patterns of stasis and change at different moments of the Paleolithic record of Liguria.

06 LITHIC (TECHNO)TYPOLOGY AND THE STUDY OF THE EUROPEAN UPPER PALAEOOLITHIC

Author(s): Reynolds, Natasha (UMR 5199 PACEA, University of Bordeaux)

Presentation Format: Oral

Numerous approaches to lithic analysis exist in the study of the European Upper Palaeolithic, stressing particular approaches to the recording, analysis and interpretation of variation in lithic assemblages. Amongst these approaches, a focus on stone tool typology has been frequently maligned, despite its fundamental importance to the culture-historical framework in use across Europe. Here, I argue that typology (better described nowadays as technotypology) continues to be vital to the study of European Upper Palaeolithic lithic assemblages. I discuss the theoretical underpinnings of the technotypological approach as I understand them, as well as their implications. In its most basic form lithic typology can be defined as the study of types of lithic artefacts, and is a powerful tool for studying past structure in human populations and change through time when it is rooted in a solid theoretical basis and a recognition of the various factors that affect variability in lithic artefacts. I present some recent examples of progress in technotypological research, including the definition of new lithic types and reviews of the robusticity of established types. I argue strongly for the importance of typology, particularly when making comparisons of multiple assemblages and as a first approach to assemblages before other types of technological analyses. However, there is also definite scope for methodological improvement, and I discuss some possible ways forward. Lithic typology can never give us the entire picture of past change and variation, but it remains a powerful and important tool for Upper Palaeolithic archaeology.

07 RETHINKING THE CULTURAL TAXONOMY OF THE EUROPEAN FINAL PALAEOOLITHIC IN LIGHT OF PARADIGMATIC BIASES AND MORPHOMETRIC METHODS

Author(s): Hoggard, Christian - Sauer, Florian - Riede, Felix (Department of Archaeology and Heritage Studies, Aarhus University)

Presentation Format: Oral

For the Middle and Upper Palaeolithic of Eurasia (Clark, 2009), the Epipalaeolithic of the Levant (Neeley and Barton, 1994) and the Final Palaeolithic of northern Asia (Vasil'ev, 2001), it has been remarked that deeply-ingrained paradigmatic differences between European and North American ways of approaching in particular the lithic evidence has critical bearings on our fundamental understanding of these periods. In traditional European approaches, there are many, often regional, cultural taxonomic units – technocomplexes, cultures, industries, groups, facies – and these are thought to reflect prehistoric 'ethnogeographic' variability. We here bring novel 2D geometric morphometric methods to bear on a large sample of Final Palaeolithic/earliest Mesolithic formal projectile point types in order to assess whether this variability can be captured quantitatively and across regions and research traditions. Combining this approach with a research-historical review of the origins of these regional taxonomic units, we ask, to what degree many of these merely are "phantom cultures" (Barton and Neeley, 1996: 139).

References:

Barton, C.M. and Neeley, M.P., 1996. Phantom cultures of the Levantine Epipaleolithic. *Antiquity* 70 (267), 139-147.

Clark, G.A., 2009. Accidents of History: Conceptual Frameworks in Paleoarchaeology. In: M. Camps and P. Chauhan (Eds.), *Sourcebook of Paleolithic Transitions: Methods, Theories, and Interpretations*, pp. 19-41. Springer New York, New York, NY.

Neeley, M.P. and Barton, C.M., 1994. A new approach to interpreting late Pleistocene microlith industries in southwest Asia. *Antiquity* 68 (259), 275-288.

Vasil'ev, S.A., 2001. The Final Palaeolithic in northern Asia: Lithic assemblage diversity and explanatory models. *Arctic Anthropology* 38 (2), 3-30.

08 LITHIC PRODUCTION AND USE IN MAGDALENIAN FRANCE: EVERYDAY LIFE AT AN OPEN-AIR SITE

Author(s): Sterling, Kathleen (Binghamton University, SUNY) - Lacombe, Sébastien (Binghamton University, SUNY; UMR 5608 TRACES)

Presentation Format: Oral

The story of Western Europe during the Pleistocene has been told primarily as a story of caves and rockshelters. The open-air Magdalenian site of Peyre Blanque (Ariège, France) was discovered as a deliberate attempt to tell a broader story of people living and moving in the broader landscape, connected to, but not exclusively of caves. Our work at Peyre Blanque is part of expanding the story of people commonly known as “cavemen”, particularly through lithic production and use connected to the site. It should be no surprise that people engaged in different activities outside of caves than inside them. However, we believe that the open-air was where people lived most of their lives, and that caves were more often the locations of special activities. Work in the open-air presents different challenges from working in caves and rockshelters, most notably locating the sites, and their state of preservation. Lithics are the key to each of these issues. At Peyre Blanque, different approaches to analysis of the assemblage within its larger context shows how this site complements and contradicts what we know about daily life in the late Ice Age. We will present an update on the ongoing work at the site.

09 APPLYING A COMBINATION OF METHODS: STUDY OF TECHNOLOGICAL CHOICES ALONG THE EARLY NATUFIAN SEQUENCE OF EL-WAD TERRACE, MOUNT CARMEL, ISRAEL

Author(s): Ashkenazy, Hila - Yeshurun, Reuven - Weinstein Evron, Mina - Kaufman, Daniel (Zinman Institute of Archaeology, Haifa University)

Presentation Format: Oral

The long sequence of the Early Natufian at el Wad enables us to see whether there are any temporal changes in the technological choices made by the inhabitant's knapping activities. Since the provenance, type and nature of the raw material and the subsistence patterns are similar along the sequence, it is possible to examine whether there is a change from the earlier to the later occupations of the Early Natufian at the site due to technological choice. The methodology used here is based primarily on attribute analysis of the lithics since refitting is not possible in such a site. In addition, a more in-depth analysis of the cores and core trimming elements was done. This methodology is advantageous as it allows an easy method to apply to the lithic material from every period (with slight adjustments- mainly typological ones), and the specific analyses and methods used can give a good characterization of the technology of that site. The study is still underway but preliminary results show that in all levels the dominant raw material type is a local one, found within the immediate vicinity of the site. This trend, of higher exploitation of the immediate area, is also visible in the stages of production. Large flake cores are absent; most of the blanks are probably the byproducts of the main sequence that was primarily aimed at producing bladelets. The endscrapers might have been brought as finished tools, and perhaps also constitute evidence of another reduction sequence, that was aimed at producing blanks specifically for endscrapers. Besides diachronic changes our study also regards spatial analysis of the various features at the site. Together they will provide a comprehensive picture of the technological choices made during the Early Natufian of this site.

10 MOBILITY PATTERNS IN EASTERN IBERIAN MESOLITHIC. THE LITHIC INDUSTRY AS A PROXY

Author(s): Cortell-Nicolau, Alfredo - García-Puchol, Oreto (PREMEDOC Research Group, Departament de Prehistòria, Arqueologia i Història Antiga, Universitat de València) - Barton, C. Michael (School of Human Evolution and Social Change, Arizona State University) - Díez-Castillo, Agustín (GRAM Research Group, Departament de Prehistòria, Arqueologia i Història Antiga, Universitat de València) - Pardo-Gordó, Salvador (GRAMPO Research Group, Departament de Prehistòria, Universitat Autònoma de Barcelona)

Presentation Format: Oral

Tracing hunter-gatherers' mobility has been a recurring topic both in anthropological and archaeological literature. Following Binford's approach (1980), ethnographic comparisons have been brought out in order to better understand mobility patterns amongst Paleolithic and Mesolithic groups, and how they relate with their environment, thus formulating a system where a main difference in mobility structure is pronounced on the distinction between residential and logistical camps.

Furthermore, and after Dibble's (1984, 1987) reformulation of the concept of retouch and how it affects our perception and interpretation of lithic assemblages, some efforts have been made in order to relate the lithic record, its constraints, contributions, and characteristic signatures with the aforementioned mobility models (Clark and Barton, 2016). In this communication we continue to explore how lithic industry can be a reliable proxy for understanding the mobility patterns of the last hunter-gatherers of the Eastern Iberian Peninsula.

By studying a number of Mesolithic lithic collections of the Mediterranean coast of the Iberian Peninsula, and the Low Aragón region, such as Cocina Cave, Benàmer, Costalena or Botiqueria dels Moros, among others, we try to bring a new insight into Clark and Barton's analysis, both by combining different sites -thus implementing geographical variability- and by taking into account functionality and its possible statistical traces, as shown by blades, bladelets and geometric microliths. We focus on the differences found at each site, according to different proxies, and how they relate with lithic industry in order to establish some “safe ground” mobility patterns for this concrete chronological and geographical environment.

11 NEW PERSPECTIVES ON CHANGES IN AUSTRALIAN LITHIC INDUSTRIES DURING THE HOLOCENE: THE CHAÎNE OPÉRATOIRE APPROACH APPLIED TO KIMBERLEY (WA) ASSEMBLAGES

Author(s): Benoit, Marine (University of Western Australia)

Presentation Format: Oral

In Australian archaeology, lithic analysis has been mostly driven by behavioural ecology and optimal foraging theory. Following such body of theories, a number of changes in Australian lithic industries have been highlighted, and often explained in terms of adaptation to shifting environmental conditions. Thus, cultural and social choices and organisations were often overlooked by scholars. These analyses, based on the quantification of artefacts' morphometric features, lack detailed qualitative depiction of the changes occurring in lithic industries.

In this presentation I propose to approach the study of Australian lithic assemblages through the application of an alternative methodology based on the French chaîne opératoire method. I believe that different explanatory models can be advanced and new interpretations of the changes in lithic technology can be provided. I will use the Kimberley region (north-west Australia) as a case study, focusing on the emergence of bifacial and point technology. During the Holocene, between 5,000 and 1,000 cal. BP, the region witnesses substantial changes in the archaeological record with the emergence of new tool-types (i.e. various point morphologies). The appearance of these new tool-types, more standardised from a morphological point of view, has been interpreted as a risk reduction strategy to cope with heightened climatic instability and less predictable resources. Nevertheless, some researchers have recently suggested that the late emergence of bifacially shaped and pressure-flaked Kimberley points could be interpreted from a social perspective. My analysis, based on the chaîne opératoire approach, review these hypotheses through the study of mid-Holocene assemblages from the Kimberley region. Via this case study I will question the efficiency of both methodologies in explaining changes in human behaviour and bring new elements in the debate on lithic technology in Australian prehistory.

514 THE DESTRUCTIVE, NON-DESTRUCTIVE, AND NON-INVASIVE: (BIO)ARCHAEOLOGICAL SCIENCES, AND NARRATING THE BODY IN THE ANCIENT EASTERN MEDITERRANEAN AND THE MIDDLE EAST

Theme: Theories and methods in archaeological sciences

Organisers: Lorentz, Kirsi (Science and Technology in Archaeology Research Center, The Cyprus Institute) - Büyükkarakaya, Ali Metin (Antropoloji Bölümü, Hacettepe Üniversitesi)

Format: Regular session

State-of-the-art methods and techniques in human bioarchaeology currently include destructive, non-destructive, minimally destructive, and non-invasive approaches. This session takes stock of current research, and explores potential for future research in human bioarchaeology in the EMME region (Eastern Mediterranean and the Middle East), a region where key developments in human history took place: domestication, writing systems, urbanisation. Papers within the session will showcase both new approaches utilising scientific techniques and methods originating in other disciplines, as well as approaches already well established in human bioarchaeology. It will critically reflect on the integration of both the standard bioarchaeological and state-of-the-art scientific and technological approaches, ranging from synchrotron radiation enabled bioarchaeology and stable isotope studies, to name a few, to digital bioarchaeology. Further, papers will address the integration of scientific and technological approaches within human bioarchaeology with theoretically informed approaches in narrating the body. The session participants will present both morphological, metric and statistical bioarchaeological research, together with funerary taphonomy, focusing on the EMME region, as well as bioarchaeological research exploring the integration of advanced scientific and technological approaches, instrumentation and tools to explore the human past, and the past human body and mortuary contexts in particular. The session participants will engage in a critically informed discussion as to the potential of new scientific techniques and new methodologies in bioarchaeological research and interpretation, as well as explore the current debates relating to the use of destructive, non-destructive, minimally destructive, and non-invasive approaches, with particular focus on the EMME region.

ABSTRACTS

01 THE DESTRUCTIVE, NON-DESTRUCTIVE, AND NON-INVASIVE: (BIO)ARCHAEOLOGICAL SCIENCES, AND NARRATING THE BODY IN THE ANCIENT EASTERN MEDITERRANEAN AND THE MIDDLE EAST

Author(s): Lorentz, Kirsi (The Cyprus Institute) - Büyükkarakaya, Ali Metin (Hacettepe University)

Presentation Format: Oral

State-of-the-art methods and techniques in human bioarchaeology currently include destructive, non-destructive, minimally destructive, and non-invasive approaches. This introductory paper explores both current research, and the potential for future research in human bioarchaeology in the EMME region (Eastern Mediterranean and the Middle East), a region where key developments in human history took place: domestication, writing systems, urbanisation. Integration of new approaches utilising scientific tech-

niques and methods originating in other disciplines, as well as approaches already well established in human bioarchaeology is key to the further development of bioarchaeology as a discipline. We will critically reflect on the possibilities and potential for integration of both the standard bioarchaeological and state-of-the-art scientific and technological approaches, ranging from synchrotron radiation enabled bioarchaeology and stable isotope studies, to name a few, to digital bioarchaeology. Further, the integration of scientific and technological approaches within human bioarchaeology with theoretically informed approaches in narrating the body will be discussed. We will engage in a critically informed discussion as to the potential of new scientific techniques and new methodologies in bioarchaeological research and interpretation, as well as explore the current debates relating to the use of destructive, non-destructive, minimally destructive, and non-invasive approaches, with particular focus on the EMME region.

02 SEARCHING FOR MALARIA IN THE EASTERN MEDITERRANEAN

Author(s): Gamble, Michelle (Austrian Archaeological Institute at the Austrian Academy of Science) - Loufouma Mbouaka, Alvie (Center for Pathophysiology, Infectiology and Immunology, Medical University of Vienna; Austrian Archaeological Institute at the Austrian Academy of Science) - Maixner, Frank - Zink, Albert (EURAC Research, Institute for Mummies and the Iceman, European Academy of Bolzano/Bozen) - Binder, Michaela (Austrian Archaeological Institute at the Austrian Academy of Science)

Presentation Format: Oral

Malaria is currently recorded in the archaeological record of the Eastern Mediterranean through the osteological changes associated with the secondary responses to the disease and genetic mutations developed to confer resistance to the parasitic infection. However this approach is problematic because of the unspecific nature of the observed changes, thus any unambiguous identification and analysis of the disease's epidemiology in the past is still impossible. Research currently being undertaken at the Austrian Archaeological Institute aims to provide more concrete methods of identification of malaria in the past through biomolecular techniques. Even though the analyses are destructive, the possibility of developing a consistent method of identifying malaria in the past would not only provide important new insights into morbidity and mortality in the past but also a significant step towards a better understanding of the evolution and spread of the disease. Moreover, this would ultimately provide the opportunity to conclusively establish if there are any consistent changes to the human skeleton and thus enable researchers to avoid these destructive methods. This paper will present some of the recent findings from the biomolecular analyses carried out within the framework of this project and discuss the challenges and issues in the search for malaria in the past. Using samples from Cyprus, Lebanon, and Egypt, we will also discuss aspects of preservation and curation, specifically as it relates to sample selection and we will include suggestions for future work.

03 PRELIMINARY RESULTS OF A MTDNA STUDY ON HUMAN REMAINS FROM ÇİNE-TEPECİK, SOUTHWEST ANATOLIA

Author(s): Büyükkarakaya, Ali Metin - Yorulmaz, Sevgi - Eroğlu Çelebi, Serpil - Özdemir, Kameray (Department of Anthropology, Hacettepe University) - Özer, Füsün - Somel, Mehmet (Department of Biological Sciences, Middle East Technical University)

Presentation Format: Oral

Anatolia is an important geography where many human populations have lived since the prehistoric times. The cultural closeness and biological affinity of these communities to each other on a daily basis has become the focus of both archaeologists and anthropologists. While trying to examine the cultural similarities and differences of these communities with each other by archaeologists, a small number of biological affinity studies have been conducted on these communities. Recently, technological and methodological developments have enabled many studies to gauge biological proximity more precisely. The most important tool used in recent studies in this sense is ancient DNA (aDNA).

In this study, the human skeletal remains that were unearthed at the Çine-Tepecik archaeological settlement (Southwest Anatolia) are studied by using the ancient DNA methodology. Some of these skeletal remains belong to the Bronze Age and the other to the Hellenistic / Roman period. The teeth of the individuals obtained from the graves of the settlement were used as source to extract aDNA. To understand changes in the matrilineal lineage and genetic variability in Çine Tepecik community we used the mitochondrial DNA (mtDNA). For the identification of the mtDNA haplogroups, two highly divergent regions (Hypervariable Region I-II, HVRI-HVRII) in the D-Loop of the mtDNA have been amplified and Sanger sequenced.

In this presentation first I will discuss the results of genetic continuity analyses conducted between Çine-Tepecik people from Bronze Age and of Hellenistic / Roman periods by using mtDNA HVRI and HVRII sequences. Additionally, we compare our results with recently published data from the literature to determine the genetic affinity of Çine-Tepecik people with their contemporaries.

04 HUMAN MOBILITY AT TELL ATCHANA (HATAY PROVINCE, TURKEY) DURING THE LATE BRONZE AGE

Author(s): Eisenmann, Stefanie (Department of Genetics, Max Planck Institute for the Science of Human History, Jena) - Ingman, Tara (Koç University) - Yener, K. Aslihan (University of Chicago, Division of Humanities) - Stockhammer, Philipp W. (Institute for Pre- and Protohistoric Archaeology and the Archaeology of the Roman Provinces, Ludwig-Maximilians-University Munich; Department of Genetics, Max Planck Institute for the Science of Human History, Jena)

Presentation Format: Oral

The Late Bronze Age in the Eastern Mediterranean is one of the best investigated periods in archaeology. Often described as the

time of “first globalization” with well-established trade networks, material evidence of imported and exported goods, as well as ideas, is abundant. Against this background of intensifying contacts often spanning long distances, the moving individual itself, despite being well represented in ancient texts, seems to escape the archaeologist’s eye. Grave contexts at best give hints, suggesting if the buried individual might be of foreign descent, but can never achieve unequivocal certainty.

The application of strontium and oxygen isotope analyses have proven to be an especially powerful method in the direct investigation of past migrations. In an extensive case study of individuals from the extramural cemetery at Tell Atchana (Alalakh), where over the past years over 130 burials have been brought to light, we aim to identify migrants as a precondition for the investigation of questions of mobility and cultural identity. These include the proportion of immigrants we have to expect at urban sites of this magnitude and the possible detection of characteristic patterns in the burials of migrant groups.

The analyses at Tell Atchana are embedded into the wider framework of the Max-Planck – Harvard Research Center for the Archaeoscience of the Ancient Mediterranean (MHAAM). In the years to come the results will be combined with genetic studies from various sites and provide new insights into the mobility behaviour of individuals and groups of people in the Bronze and Early Iron Age world of the Eastern Mediterranean. This presentation focuses on preliminary results and analyses that shed light on the life histories of individuals from this first international age.

05 AN ARCHAEOZOOLOGICAL STUDY BY ZOOMS AND STABLE ISOTOPES ON TELL HUMEIDA, A MIDDLE URUK SITE IN THE SYRIAN EUPHRATES VALLEY

Author(s): García-Vázquez, Ana - Pérez-Rama, Marta (Instituto Universitario de Xeoloxía, Universidade da Coruña) - Moreno-García, Marta (Instituto de Historia, CCHS-CSIC) - Sanjurjo-Sánchez, Jorge (Instituto Universitario de Xeoloxía, Universidade da Coruña) - Montero-Fenollós, Juan Luis (Instituto Universitario de Xeoloxía, Universidade da Coruña; Universidade da Coruña, Facultade de Humanidades e Documentación) - Grandal-d’Anglade, Aurora (Instituto Universitario de Xeoloxía, Universidade da Coruña)

Presentation Format: Oral

Tell Humeida is an archaeological site located in the Middle Euphrates valley, 75 km north of Deir ez-Zor, in Syria. Field work carried out by a team from the University of Coruña between 2006 and 2011 has shown that the main occupation of the site corresponds to the Middle Uruk or Late Chalcolithic Period 4 (3780-3520 cal BC). A rubbish dump belongs to this historical phase, where abundant bones of fauna, charcoal and pottery were found. Animal bone remains, belonging to domestic or wild fauna, consumed or not, are generally very fragmented. Therefore, it is difficult to carry out a faunal study that accurately reflects the specific composition of the accumulation.

Minimally destructive molecular techniques, such as peptide fingerprinting characterization (ZooMS) of bone collagen, can solve this problem. The basis of the ZooMS technique is relatively simple. Although all vertebrates have a similar gene from which the bone collagen molecule is synthesized, there are small differences in the sequence of nucleotides in the DNA between different taxa, and therefore small differences in the sequence of collagenic amino acids. Collagen isolated from a bone is broken into a set of peptides of different mass/load, identified by MALDI-TOF (Matrix-Assisted Laser desorption/ionization, time of flight). Among these peptides, some are characteristic of a certain taxon, allowing the identification.

Here we carry out this type of study on a set of bone remains recovered in Tell Humeida in order to identify the faunal assemblage. The isolated collagen was also object of stable isotope analysis, yielding valuable information on the livestock management and hunting strategies. Starting from mostly unidentified bone fragments of just 1 to 2 grams, the result provides interesting information on the way of life of Tell Humeida’s inhabitants and the palaeoenvironmental conditions in which they lived.

06 TIMING AND FREQUENCY OF HEALTH-RELATED STRESS: ASSESSMENT OF 3RD MILLENNIUM BCE SHAHR-E SOKHTE USING DENTAL HISTOLOGY

Author(s): Lemmers, Simone (Skeletal Biology Research Centre - SBRC, School of Anthropology and Conservation, University of Kent; The Cyprus Institute - Cyl) - Dirks, Wendy (Department of Anthropology, Durham University) - Reid, Donald (Center for the Advanced Study of Human Paleobiology - CASHP, George Washington University) - Mahoney, Patrick (Skeletal Biology Research Centre - SBRC, School of Anthropology and Conservation, University of Kent) - Sajjadi, Mansoor - Foruzanfar, Farzad (Iranian Center for Archaeological Research - ICAR) - Lorentz, Kirsi (The Cyprus Institute - Cyl)

Presentation Format: Oral

During tooth formation, accentuated lines form in correlation with timing of physiological disturbances caused by stressful events. These markers of stress remain permanently recorded in teeth and assessment of this pattern therefore gives insight into the timing and amount of stress an individual endured during a specific time in their development. In this study, we examined accentuated line sequences from a population from the Iranian Bronze Age site of Shahr-e Sokhte, a large urban site dated to the 3rd millennium BCE. Our objectives are to examine the timing and the frequency of accentuated line formation among individuals during early infancy, to assess the amount of stress perceived and if there are reoccurring patterns or clusters during specific periods of early life. Tooth samples were taken from 10 individuals (n=10), aged between 2 to 12.5 years of age. We targeted the first permanent molar and permanent incisors of the lower mandible, covering a developmental time span from birth till age +/- 2.5 years (based on Reid et al. 1998). Using histological sections, we calculated enamel formation time, presence and position of the neonatal line (indicating birth) and the number and position of accentuated lines using transmitted light microscopy. We calculated the position of each accentuated line by calibrating its position to the neonatal line (Age=0), thereby assigning ages to stress events. Analysis of the

presence, timing and frequency of the accentuated lines will allow us identify periods of increased developmental stress, which could be related to stresses such as malnutrition.

07 MAPPING METAL ELEMENT LOCALISATION IN ANCIENT HAIR USING SR-XRF: METALS AND HEALTH AT 3RD MILLENNIUM BCE SHAHR-E SOKHTE

Author(s): Lorentz, Kirsí (The Cyprus Institute) - Cotte, Marine (ESRF - European Synchrotron Radiation Facility) - Ioannou, Grigoria (The Cyprus Institute) - Foruzanfar, Farzad (ICAR) - Sajjadi, Mansoor (ICAR)

Presentation Format: Oral

Within this project synchrotron radiation X-Ray Fluorescence (SR-XRF) was used to explore biogenic versus diagenetic/environmental uptake of metals, and copper in particular, in ancient human hair. The scanning X-ray microscope optimized for 2D μ XRF (elemental maps) was used at ESRF (European Synchrotron Radiation Facility) beamline ID21 to obtain detailed maps of the localisation of metal elements, including Cu, in ancient hair sections (10 μ m) of eight individuals (n=8), as well as modern hair controls (n=2). Only a handful of studies using synchrotron radiation enabled approaches to ancient human hair have been undertaken to date, few studies explore metal element distribution within ancient hair, and none Cu in specific. Within this study, significant differentiation in the levels of Cu were discovered between different skeletal individuals from the site of Shahr-e Sokhte, a 3rd millennium large urban site with intensive craft work activities from ancient Iran. In particular, hair of a young female showed elevated levels of Cu, with highest values distributed within the cortex, rather than the cuticle and the medulla area. This distribution of elevated levels of Cu points to biogenic, rather than diagenetic/environmental source for the uptake of Cu in this hair section. Hair sections of other individuals from the same site contained significantly lower levels of Cu. While Cu in specific speciation and levels is necessary for human health, other Cu species and levels are detrimental to human health.

Funding Citation: Beamtime at ESRF ID21; LAAMP Grant/Lorentz

08 OSTEOLOGY OF SUBURBAN HELLENISTIC/ROMAN POPULATIONS OF PAPHOS (CYPRUS) AND ADVANTAGES OF/POTENTIAL FOR SYNCHROTRON RADIATION ENABLED BIOARCHAEOLOGY

Author(s): Ioannou, Grigoria (The Cyprus Institute) - Kouali, Margarita (Department of Antiquities of Cyprus) - Lorentz, Kirsí (The Cyprus Institute)

Presentation Format: Oral

This paper presents preliminary results from the osteological analysis of the Hellenistic and Roman necropolis of Ktima-Upper City situated in Paphos, Cyprus (n=120). The Ktima-Upper City necropolis is located approximately 4 km from the ancient metropolis of Nea Paphos, both comprised by monumental multi-burial rock-cut tombs with multiple and rich mortuary findings. The archaeological context indicates that Ktima-Upper City was part of suburban Paphos, enabling the investigation of a series of questions related to the potential effects of urbanism on the life and health of the population buried within this necropolis. This study is part of a larger research project focusing on the analysis and comparison of contemporary populations dating to the Hellenistic and Roman periods from Cyprus and the wider Eastern Mediterranean region, focusing on health, disease, dietary and demographic patterns, as well as mortuary behaviour. While standard human bioarchaeological approaches involving macroscopic, microscopic and metric techniques are being applied to the analysis of human remains from the necropolis of Ktima-Upper City, synchrotron radiation enabled approaches are being developed and explored. Within this paper, we discuss the way in which synchrotron radiation techniques can be integrated to the bioarchaeological investigation of Ktima-Upper City and their contribution to narrating the bodies from this site. Applications include synchrotron radiation infrared (SR-IR) analyses of the preservation status of the human remains, and synchrotron radiation phase contrast micro computed tomography (SR-phase contrast microCT) in order to explore health stress and life histories through non-destructive histological analyses of accentuated lines in dental enamel.

09 RECONSIDERING THE BURIAL PRACTICE FROM AGE-AT-DEATH STRUCTURE IN THE ANCIENT EASTERN MEDITERRANEAN AND THE MIDDLE EAST

Author(s): Miyauchi, Yuko (University of Tsukuba) - Lorentz, Kirsí (The Cyprus Institute)

Presentation Format: Oral

People in the ancient Eastern Mediterranean and the Middle East buried their dead in various places in various ways throughout time. When focusing on the location of burial, during the Neolithic all of the dead were generally buried in the residential area, often under the floor of buildings. However, from the Late Neolithic, when outdoor communal cemeteries emerge in some of the sites, the burials found from the residential area becomes mainly children (especially very young individuals), and division of the burial place for children and adults can be observed. This tendency is continued in the following period, and it is highly likely that changes in the views on children and childhood happened in this period. However, discussion of the boundary to divide the burial place is insufficient in the previous studies. Even in the cases where children and adults are buried together, the age-at-death structure can be an important tool. When several individuals are buried closely together in one area, the age-at-death structure can be a clue to consider the relationship of these individuals. In this paper, human remains from the Neolithic to Chalcolithic in the Eastern Mediterranean and the Middle East are studied, to reconsider the burial practice from the age-at-death structure.

10 FUNERAL PRACTICES AND FOODSTUFF BEHAVIOUR IN THE PRE-POTTERY NEOLITHIC OF CENTRAL JORDAN: EVIDENCE FROM KHARAYSIN AND AIN GHAZAL

Author(s): Santana, Jonathan - Millard, Andrew (Department of Archaeology, Durham University) - Ibáñez, Juan José (Spanish National Research Council, Institución Milà y Fontanals) - Muñiz, Juan (Pontifical University of Salamanca) - Rollefson, Gary (Whitman College) - Kafafi, Zeidan - Alrousan, Mohammad (Department of Anthropology, Yarmouk University)

Presentation Format: Oral

In this contribution, we explore the funerary practices and the osteobiographical profile of the individuals from Kharaysin, a Pre-Pottery Neolithic site located in the village of Quneya, in the Zarqa River valley (Jordan). We have documented an archaeological sequence from the Late Pre-Pottery Neolithic A (LPPNA) to the Middle Pre-Pottery Neolithic B (MPPNB). This process coincides with the consolidation of the sedentism and the appearance of large-scale settlements in Central Levant such as Ain' Ghazal and Jericho. Kharaysin includes several well-preserved architectural levels with a large repertoire of burials, lithic industries, faunal remains, figurines, and personal ornaments. Funerary customs come from the PPNA and PPNB levels, including primary and secondary burials, disturbance of burials, and skull-caches. In addition, we analyse stable carbon and nitrogen isotopes on human remains to investigate the impact of agro-pastoral practices on diet. In order to provide a basis for comparison with Kharaysin results, we also examine carbon and nitrogen isotopes of human remains from Ain Ghazal, a major Pre-Pottery Neolithic site located in the same area. We discuss this set of evidence in order to stress how integration of instrumental and traditional human bioarchaeology may be addressed to explore the social changes that took place during the Neolithic transition in the Near East.

515 BUILDING STORY STRUCTURES - EARLY MONUMENTALISM IN NEOLITHIC EUROPE

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Sorensen, Lasse (The National Museum of Denmark) - Gebauer, Anne Birgitte (The National Museum of Denmark) - Andersen, Niels H. (Moesgaard Museum) - Teather, Anne (Manchester University)

Format: Regular session

An integral part of the first farming communities was the construction of imposing public structures in the form of public places of assembly, enclosures and funerary monuments. The purpose of the session is to discuss various theories about why monumental architecture became an integral part of early Neolithic societies in Europe.

The construction of manmade demarcations in the landscape has been related to social changes produced by social, economic, technological and climate changes in relation to the introduction and development of farming and agriculture. In many areas, funerary structures are the first major monuments to be built whereas enclosure building may require a certain critical mass in terms of population and level of organization and represent a hallmark of fully established Neolithic way of life.

Alternatively, the collaboration in the making, maintenance and continual rebuilding of monuments may have played a central role in creating a shared narratives, identity and commitment in a large-scale society. The demands of cohabitation in larger groups and participation in wider networks required new cultural and cognitive capacities embodied in the symbolic representations stored in the monuments. The growth of larger and more complex social groups manifested in the development of more substantial architecture and elaborate ways of treating the dead may in fact be what is driving the economic diversification and intensification.

Thus, the focus of this session is the different theories about the relationship between monumentality and the Neolithic way of life.

ABSTRACTS

01 INTRODUCTION TO THE SESSION: BUILDING STORY STRUCTURES - EARLY MONUMENTALISM IN NEOLITHIC EUROPE

Author(s): Sorensen, Lasse - Gebauer, Anne Birgitte (The National Museum of Denmark) - Teather, Anne (Manchester University) - de Valera, António Carlos (NIA-ERA Arqueologia, Interdisciplinary center for Archaeology and Evolution of human behavior, Dafundo)

Presentation Format: Oral

The introduction to this session will present some of the overall ideas behind the theme of early monumentalism in Neolithic Europe and beyond together with a publication plan. Furthermore, the Organisers will present a short overview of the papers presented in this session together with three examples (through experimental archaeology, ethnographical records and modern monuments) of building story structures, which can serve as inspiration to give valuable insights to the various theories about why monumental architecture became an integral part of early Neolithic societies in Europe. The construction of manmade demarcations in the landscape has been related to social changes produced by social, economic, technological and climate changes in relation to the introduction and development of farming and agriculture. In many areas, funerary structures are the first major monuments to be built whereas enclosure building may require a certain critical mass in terms of population and level of organization and represent a hallmark of fully established Neolithic way of life.

Alternatively, the collaboration in the making, maintenance and continual rebuilding of monuments may have played a central role in creating a shared narratives, identity and commitment in a large-scale society. The demands of cohabitation in larger groups and participation in wider networks required new cultural and cognitive capacities embodied in the symbolic representations stored in the monuments. The growth of larger and more complex social groups manifested in the development of more substantial architecture and elaborate ways of treating the dead may in fact be what is driving the economic diversification and intensification.

Thus, the focus of this session is the different theories about the relationship between monumentality and the Neolithic way of life.

02 PREHISTORIC FLINT MINES AS MONUMENTS

Author(s): Teather, Anne (University of Manchester)

Presentation Format: Oral

Over six decades ago Stuart Piggott categorised Neolithic flint mines as monuments. Prehistoric mines are acknowledged as monumental for the purposes of cultural resource management, and across northern Europe are under the care of national bodies. Spiennes, Belgium, is a UNESCO World Heritage Site and Krzemionki, Poland, is on the tentative list for similar status. Recent research by this author and by others has confirmed their importance in the earliest Neolithic of Europe, and their deposits have been shown to be similar in character to those in other monumental settings. However, the nature of their predominately below-ground architecture means they have been neglected in wider discussions of monumentality. Mines have been classified as economic areas of extraction which, even if ritualised, are not regarded as monumental. Debates of what kinds of structures can be defined as monuments seemingly focuses on what the concept of monument means for us as archaeologists, and not necessarily on the role of monuments in past social systems. The marginalisation of these sites may be attributable to an approach that emphasises that monuments are either mortuary spaces or gathering places; a simplifying dualism that supports a strongly normative account of the Neolithic.

This paper challenges these views in two ways. Firstly, it is argued that flint mines are not predominantly economic but are also places where social aggregation, mortuary activities and other events took place, and secondly, they are not solely underground sites. Instead it is proposed that they are complex, tiered architectural spaces that fulfil many of the attributes and inferred purposes of monumental structures.

03 SOCIAL MEMORIES AND MONUMENTALITY: TRIGGERS OF NEOLITHIC SOCIETIES

Author(s): Brozio, Jan Piet - Müller, Johannes (Institute of Pre- and Protohistoric Archaeology CAU Kiel)

Presentation Format: Oral

The manifold changes of daily life and landscapes during processes of primary and secondary neolithisation made stable ideologies important for new social identities. Consequently, focal sites and long-lasting networks were necessary to construct 'the world'. The reception of these processes led in many European regions to the creation of 'monumental landscapes' that reflect an effort to create materialized social memory.

If so, we have to keep in mind that institutional knowledge in non-literate societies is translated by different revenues from generation to generation. One of the most important media for memory transformation is their materialisation at focal places of these societies. Biographies of Neolithic monuments of European communities offer diverse rhythms in the creation of such ancestral and social memories. Examples from enclosures and megaliths display this materialisation and the active roles these monuments play in such transformation processes. This can happen independently at different places in different times.

During the Collaborative Research Project "Early Monumentality and Social Differentiation" we were able to reconstruct such site biographies with their timelines for North Central Europe. Especially the change from horticulture to agriculture marks a distinct complex connectivity that is reflected also in the reconstruction of local identities. Surprisingly, different monuments were in use (constructed and re-constructed) for centuries. As focal landmarks changing ideologies are also visible within their biographies. Interestingly, they represent continuities, while in other social domains discontinuities are visible.

04 BUILDING MONUMENTS, CREATING COMMUNITIES - THE ROLE OF EARLY MONUMENTAL ARCHITECTURE AS MEANS OF SOCIAL COHESION

Author(s): Notroff, Jens (German Archaeological Institute)

Presentation Format: Oral

Monuments have been interpreted as indicator of social complexity and expression of power and authority. Subsequently, monumentality has been seen as agent of complex social processes representing the constitution and boundaries of group dynamics. Surprisingly, recent research at the early Neolithic site of Göbekli Tepe in southeastern Turkey has produced one of the oldest yet known evidence of monumental architecture - in a hunter-gatherer context of the 10th and 9th millennium BC. There, on a remote hilltop in the Germus mountain range, monolithic T-shaped pillars with a height of up to 5.5 m (richly decorated with naturalistic motives, mostly animals, and abstract symbols) were erected by still highly mobile groups, constituting large circular enclosures. The necessary labour and effort involved in the process of planning and constructing these monuments indicates a degree of coordination and cooperation between different groups of the region hitherto not suspected. The material culture and iconography present at Göbekli Tepe and other related sites of the wider vicinity imply a shared communication space between several of such

groups. Furthermore, finds of large amounts of animal bones hint at extensive feasting and the different monuments bear witness of repetitive construction activity, suggesting an important function of these communal building projects in the formation of larger communities in the Near Eastern Pre-Pottery Neolithic.

05 THE MONUMENTAL GLUE OF SOCIAL RELATIONS AND RANK WITHIN THE EARLY FUNNEL BEAKER CULTURE

Author(s): Sorensen, Lasse (The National Museum of Denmark)

Presentation Format: Oral

This paper will investigate the rise of ranked societies during the early 4th millennium BC in Northern Europe by arguing, that the building of different monuments in these contexts was the key catalyst for the success or failure of upholding closer networks and formation of archaic chiefdoms. The hypothesis will be investigated by integrating three examples from South Scandinavia concentrating on the core (Denmark, South Sweden) and periphery (Central Sweden and Southern Norway) area of the northern parts of the Funnel Beaker Culture. The first example will focus on the first monuments of open spaces made by the pioneering farmers from 4000 to 3800 cal BC. The second example will concentrate on the large scale long barrows and enclosures made by more consolidated Neolithic societies from 3800 to 3500 cal BC. The third example will be based on the widespread megalithic monuments, especially within the periphery of the Funnel Beaker Culture from 3500 to 3300 cal BC. It is thus possible to discuss the diachronic development and complexity within the formation of leadership and creation of followership within the core and periphery area of the early Funnel Beaker Culture and its neighbouring hunter-gatherer societies in South Scandinavia from 4000 to 3300 cal BC.

06 CELEBRATING STONES - MEGALITH BUILDING TRADITIONS AMONG ANGAMI-NAGA, NORTHEAST-INDIA

Author(s): Wunderlich, Maria (Institute of Pre- and Protohistoric Archaeology, University Kiel)

Presentation Format: Oral

As being one of the few remaining areas in the world with a living memory of megalith building activities, Nagaland is a region of great interest also for archaeologists interested in the possible role of it in socioeconomic and political relationships. The high amount of literature and the conduction of ethnoarchaeological surveys provide detailed information on possible social mechanism influencing this specific tradition, which can be used to enlarge the understanding of prehistoric monumentality.

An integral part of megalith building activities among Angami communities is their function as commemorative monuments. Thus, they do not only serve as a memory of the personal accomplishments of the builder, but also as a memory of particular deceased persons. While collectively build stone platforms functioning as gathering places are also present, the most common form of megalithic construction are standing stones. Those are a result of long lasting and complex feasting series.

The organization of the required feasting series and the erection of the megalithic monuments themselves are closely linked to a high expenditure of economic resources. Thus, they reflect the ability of a household to provide an appropriate surplus over several years. Even more importantly though, are cooperation and collective scopes of action among the involved communities. This includes complex societal structures aiming at the maintenance of social cohesion in the completely self-sufficient villages.

Megalith construction activities among Angami-Naga are a multi-faceted tradition, which may provide theoretical suggestions and challenge usual interpretations of the Early Neolithic megaliths in modern-day Europe.

07 MONUMENTS AND NARRATIVES - TRANSFORMATIVE PROCESSES OF MONUMENTS, PRESTIGE GOODS AND SOCIAL PRACTICES IN THE WESTERN BALTIC REGION

Author(s): Brozio, Jan Piet (Institute of Pre- and Protohistoric Archaeology CAU Kiel)

Presentation Format: Oral

The Neolithic period in the Western Baltic Region is intensely characterized by the phenomenon of different forms of monumental structures. Monuments like long barrows, enclosures, megalithic graves and burial mounds can be linked to transformation processes like new subsistence strategies, different organized domestic locations, demographic changes or the introduction of new technologies like the ard, new flint technologies or early metallurgy. In the focus of this paper are transformations of social practices, like changes from corporative to individualized social behaviour or the change of prestige equipment as an indicator for new and changes of ideologies in Neolithic societies. Therefore the collective construction, the ritual use and secondary use of monuments in different Neolithic periods but also settlement patterns, subsistence practices, tool production and social impressions through shapes and decoration of ceramics plays an important role in the relationship between the Neolithic way of life and monumentality. New researches in a microregion in Northern Germany refer furthermore, that the transformation of social practices potentially are the mainly important drivers in the developed Neolithic societies in the Western Baltic Region than economic practices. In comparison with quantifying methods we can observe different functions of monuments like organization, representation or expression of identities for the Neolithic communities.

08 **SETTLING THE MONUMENTAL ISSUE IN THE DUTCH WETLANDS**

Author(s): Nobles, Gary (University of Groningen)

Presentation Format: Oral

In the Dutch wetlands monuments were not an integral part of early Neolithic life, simply because they did not exist at the time. No evidence of traditional monumentality has been observed in this region until the Late Neolithic. In this region the relationship between social change and technological innovation is not culturally defined; societal change occurred at a slower pace than cultural identity. The Hunter-Gatherer lifestyle did not give way to a Neolithic lifestyle, in fact the Neolithic lifestyle became incorporated into an already established Hunter-Gatherer way of life. How this inclusion of agricultural practice and animal husbandry alongside hunting, gathering, fishing, and fowling demonstrates the uniqueness of this region, people's ability to adapt and mold the Neolithic concepts onto their long developed world view. The interplay between tradition and the manifestation of the Neolithic ideology is highly complex, only recently has evidence come to light which indicates the presence of monumentality in this region. The early monumentalisation appears to have been established in the late Neolithic, why this happened so late relative to the European context, how this fits within the peoples world view, and what this means in regards to cultural identity is the subject of this paper.

09 **EMERGENT CAUSATIONS OF CENTRALITY AND MONUMENTALITY IN SOUTHERN IBERIAN SETTLEMENT AGGLOMERATIONS DURING THE 3RD MILLENIUM**

Author(s): Schlicht, Jan-Eric - Hinz, Martin (Institut für Ur- und Frühgeschichte CAU Kiel)

Presentation Format: Oral

The Copper Age of the Iberian Peninsula is characterised by the increasing complexity of social configurations. This is reflected in the domain of domestic and funeral architecture in marked changes of the intrasite, but also in the overarching structure (agglomeration), and in the occurrence (and decline) of megalithic components.

Discussing social organization of chalcolithic groups of the area, issues of centrality and the integration of enclosures and mega-sites into supraregional networks are crucial, as well as their "monumentality" as built elements modifying the natural space.

Contrary to other European territories, at the turn of the 4th to the 3rd century BCE, an increase of so-called enclosures of different characters can be observed in southwestern Iberia. We observe the formation of sites with stone fortifications (e.g. Zambujal or Leceia), but also the appearance of various types of ditched enclosures, whose functions have been characterized from settlement boundaries to ritual activities. During the 3rd millennium, we also observe the formation of so-called mega-sites, especially Valencina de la Concepción, which currently can hardly be characterised as an enclosure.

We interpret these processes as emergent causations, as a field of application for pragmatic theory and archaeological cultural geography. Certain centralization tendencies following the coexistence of larger groups increase the probability for other centralization processes, shaping the trajectories of social groups and their complexity in a self-reinforcing feedback in the long term. Consequently, we ask whether observations can be linked to social change. Individual sites are compared in function and duration, their topographical location and materiality in order to identify emergent patterns.

Through the spatial and material analysis of the sites, we expect insights into the character of chalcolithic societies in southwestern Iberia and those structures which ultimately led to the collapse of the chalcolithic system in the transition to the Bronze Age.

10 **REDISCOVERING THE OLDEST BURIAL MOUNDS OF NORTHERN POLAND. THE ONGOING REVOLUTION**

Author(s): Pospieszny, Lukasz - Jakubczak, Michal (Institute of Archaeology and Ethnology, Polish Academy of Sciences) - Kiarszys, Grzegorz (Department of Archaeology, Szczecin University)

Presentation Format: Oral

The early monumentality of the Polish lowlands is marked mainly by the appearance of the earthen long barrows in the 4th millennium BC. They were built to serve as tombs of adult and elderly males which is usually interpreted as reflecting the presence of ranked societies capable of enormous labour investments. The absolute age of these monuments remains unknown as few available ¹⁴C dates were made mainly for charcoals found below or within the mounds. However, recent years brought the discovery of many new barrows thanks to the next revolution in archaeology, based on introducing Airborne Laser Scanning (ALS) and other remote sensing technologies (aerial photography, satellite imaging, geophysics), and providing easily accessible data available on-line (e.g. Google Earth, national geodata repositories). These advancements lead to detection of unknown Neolithic monuments both in forests and arable lands. Surprisingly, the earthen long barrows were discovered not only in the regions like Kuiavia or Pommerania, where they were first noted and excavated, but also in more peripheral regions.

We will discuss the results of our aerial, geophysical and fieldwalk surveys in a number of research areas in northern Poland. Examples of mounds preserved both in woodlands and rural landscapes will be presented. Special attention will be paid to the problem of non-invasive evaluation of the size and shape of mounds and spatial organisation of entire cemeteries. We will reconsider the place of Polish long barrows within the context of the European Early-Middle Neolithic monumental architecture. Issues like subsistence strategies, social organisation and exchange systems will be addressed as well by referring to the recently acquired genomic and isotopic data from Kuiavia.

The research was supported by National Science Centre (Poland) research grant no. 2014/15/D/HS3/01304

11 EARLY NEOLITHIC FUNERARY MONUMENTALISM IN BRITAIN AND IRELAND: THE CONTINENTAL CONNECTION

Author(s): Scarre, Chris (Durham University)

Presentation Format: Oral

The development of funerary monumentalism is a prominent feature of Neolithic societies of the 5th and 4th millennium in western and northern Europe. Their chronological position within regional sequences, however, is varied. In some regions, such as Iberia, the first monuments appear among long-established Neolithic communities; in others, such as Britain and Ireland, they emerge only two or three centuries after the Mesolithic/Neolithic transition. In Britain and Ireland, recent research generally supports a colonist-farmer model for the introduction of the Neolithic. The appearance of the first Neolithic funerary monuments so soon after the Neolithic transition raises the possibility that they, too, may have derived their ancestry wholly or in part from models found earlier in northern France. Such a genealogical perspective must be balanced, however, by considering the materiality of the monuments themselves. Like their continental predecessors, they will have encoded and expressed symbolic relationships and concepts, not least in the selection and extraction of the materials from which they were built. The continental ancestry behind the use of large stones – megalithic blocks – also demands careful consideration. Regional traditions within British and north French Neolithic monumentality, and their possible interconnections, will be examined so as to place these issues in their broader geographical context.

12 A NARRATIVE FOR SCOTTISH NEOLITHIC MONUMENTS

Author(s): sheridan, alison (Dept. Scottish History & Archaeology,)

Presentation Format: Oral

Scotland is rich in Neolithic monuments. Much work has been done over the years to describe and characterise them, to understand their construction and to date their contents. This allows us to understand what monuments were built when, and to construct narratives for why they took the form that they did, and how and why they changed over time. The earliest monuments – the megalithic and non-megalithic funerary constructions – were of Continental types. Their appearance can be accounted for by the two strands of Neolithisation to have affected Scotland: the Breton, Atlantic façade strand in the west, bringing the tradition of building megalithic closed chambers and simple passage tombs, and the [Chasseo-Michelsbergoid] Carinated Bowl (CB) Neolithic, arriving in the east and bringing timber and earthen constructions. Similarities between CB non-megalithic monuments and those seen in southern Scandinavia can be accounted for by shared ancestry (rather than by direct contact, for which no evidence exists).

The different trajectories of monument development in Scotland are then explored. The translation into stone of the CB non-megalithic monument format in western and south-west Scotland is traced, along with the fusion of that tradition with the passage tomb tradition in parts of the west. Expansion of monument building corresponds to the secondary expansion of farming communities to the Western and Northern Isles during the 38th century. This is followed by further regional diversification of monument styles, with some notable examples of aggrandisement – a form of competitive conspicuous consumption. Power play strategies around 3200–2900 BC explain the similarities between Orcadian Maes Howe-type passage tombs and those in the Boyne Valley in Ireland, and also explain the southwards spread of the use of stone (and timber) circles.

13 LIFE BY THE LAKE, DEATH IN A DOLMEN?

Author(s): Verdonkschot, Jadranka (Universität Tübingen; Universidad de Alcalá) - López-López, Adara (FPU-MECD Research Fellow, University of Alcalá)

Presentation Format: Oral

The current paper aims to explore the possibility of a link between Central European megalithic monuments and some of the first farming communities there; the people inhabiting lakesides in the circum-Alpine area. These communities seem to represent the earliest Neolithic in some areas, those apparently avoided by the earlier LBK-settlers, and contribute much to Neolithic research thanks to their rich inventory, preserved in the wetland contexts. What lacks in this inventory are any signs of the deceased or burial rituals. Nevertheless, the contemporaneity of several megalithic monuments with lakeside settlements has hinted at the possibility of certain connections. Available indications that this line of investigation could be fruitful are for example the Zug-type axes, found at Neolithic lakeside settlements, apparently inspired by the alpine jade axes found in megalithic Brittany, or the presence of elements bearing visual and perhaps conceptual similarity, such as the decoration of a house façade in Sipplingen (Germany) or the frequently present gynaecomorphic vessels. A dive into this topic could cast light on the burial rituals, and thereby identity and community, of the people living and dying in the wetlands of Neolithic Central Europe. Moreover, the extensive information on the networks of these communities could contribute to questions regarding how megalithic monuments in different regions were, or were not, connected.

14 STONES AS BOUNDARIES – STONES AS MARKERS

Author(s): Larsson, Lars (Department of Archaeology and Ancient History)

Presentation Format: Oral

Excavations have been conducted at a megalithic tomb located at Vale de Rodrigo, Alentejo, southern Portugal. The investigation showed that the passage grave was large with orthostats almost four metres in height. Outside the passage a forecourt with stone

pavements, burials and a large number of artefacts was found.

In constructions and their detailed features, it is possible to follow a process in which access and screening are predominant themes. The tomb relates a long and eventful story in combination with the conceptual world of generations.

The megalithic tomb was constructed on an earlier settlement. The tomb was furnished with a forecourt for different activities. Shortly after construction the tomb incorporated a subdivision of the chamber as well as the passage, which also provided marked boundaries.

Initially it was possible to walk into the chamber straight-backed. In a later stage the passage was extended and made narrower. The forecourt started to be filled up with soil from the sloping sides that made entry even more difficult. During this stage the forecourt was used for sacrifices of vessels and other ritual activities. During an even later stage the passage was sealed and a stone paving was formed, leading to the passage. Thereafter, the passage was closed, but the forecourt then assumed the status of a burial place. These different stages will be related to the social system of the megalith builders and users.

15 HUNDREDS OF MEGALITHIC MONUMENTS = FULL NEOLITHIC WAY OF LIFE? THE ESTABLISHMENT OF NEOLITHIC SOCIETIES ON RÜGEN ISLAND, GERMANY

Author(s): Behrens, Anja (German Archaeological Institute)

Presentation Format: Oral

The south-western Baltic coast is known for its long mesolithic traditions reaching deep into the neolithic period. The full change into neolithic way of life appeared from the Middle Early Neolithic (EN) onwards. On the island of Rügen this change is proven by hundreds of megalithic graves. Recent excavations and research reveal that around 3700/3600 cal BC large groups of megalithic monuments are created and thus forming a new type of burial landscape. Most of the monuments stayed in use until the end of the Funnel Beaker Culture. But early 14C-dates of cereals on the one side as well as settlement sites reaching throughout the mesolithic into the EN on the other are indicators of a far earlier arrival of the Neolithic way of life. The definition what a "full" Neolithic life includes is crucial to determine an exact point of establishment. On Rügen the megalithic graves are characterised by a uniform architecture. Unlike the western neighbouring area not much development is visible. It seems as if the idea of building megalithic monuments for the dead arrived in one wave and was adapted completely, with only few further influences and changes. Does it mark the now fully established Neolithic way of life or would an already founded Neolithic society be necessary to implement such ideas? Both approaches shall be discussed within the light of new data and research results.

16 COMPLEXITY OF MEGALITHIC LANDSCAPES: THE ROLE OF CLUSTERING OF MONUMENTS IN EARLY NEOLITHIC SOCIETY

Author(s): Gebauer, Anne Birgitte (National Museum of Denmark, Copenhagen)

Presentation Format: Oral

Thousands of megalithic monuments were built between about 3500-3200 BC in the Northern Funnel beaker group. Oftentimes these megalithic tombs are found in small clusters including several different types of monuments in spite of the fact that the contemporary habitation appears to be spread out more evenly in the landscape. The purpose of this paper is to investigate the character of these groups of megalithic structures and how they relate to the Neolithic way of life. Through a number of case studies in Southern Scandinavia and northern Germany, the composition and chronology of the groups of monuments is investigated along with the placement in the landscape in relation to settlements, enclosures and topographical features. The consistent pattern of territorial organization that is revealed by these groups of monuments is considered in relation to the development of farming and agriculture as well as the social changes that may be discerned within these early farming communities. Finally, based on detailed analyses of the ceramic depositions at two dolmens, a passage grave and a cult house, the events taking place at the individual structures within a single megalithic cluster are investigated. Furthermore, the internal and external relations among the builders of this group of monuments are discussed.

17 THE NEOLITHIC ROUNDEL AND ITS SOCIAL CONTEXT ON THE FARTHEST REACHES OF THE DANUBIAN WORLD

Author(s): Czerniak, Lech (Institute of Archaeology and Ethnology, University of Gdansk) - Dziwanowski, Marcin (Institute of Archaeology, University of Poznań) - Matuszewska, Agnieszka (Department of Archaeology, University of Szczecin) - Pospieszny, Łukasz - Jakubczak, Michał (Institute of Archaeology and Ethnology, Polish Academy of Sciences) - Szubski, Michał (Institute of Archaeology, Cardinal Stefan Wyszyński University in Warsaw)

Presentation Format: Oral

Roundels represent the oldest monumental objects in Europe, and served as places of meetings and rituals of communal character. They appeared in ca 4850 cal BC and spread very quickly almost all over the area of the "Danubian World". They disappeared after 200-300 years. However, the idea of "ditch enclosures" was repeatedly invoked later in different forms and contexts, but – perhaps – in similar circumstances of dramatic social changes. All ditch enclosures, through the construction process, extension and cyclical renovations, and then as a place of common celebration were an important institution of social integration. However, the roundels had the extra "power" given by structural connections with cosmic forces. The subject of the paper is a roundel at Nowe Objezierze

located in the area of the lower Oder river. Its historical context was fundamentally different than in the environment of the Lengyel culture in Hungary, Slovakia, and Austria (where roundels were “invented”), or in the Stroked Pottery culture area in Lower Silesia, Czech, and Saxony, where the occupation was long-lasting, intense, and continuous. Although this roundel appeared in similar time as the above mentioned, it was built in the region where it represented the beginning of new occupation (SBK) that emerged after the LBK decline. It occurred in the form of quite numerous but small and short-lived hamlets. These observations shed new light on the role of roundels in building social ties that were broken with the LBK decline.

18 CONNECTED STORIES IN THE NEOLITHIC, NORTH OF PORTUGAL. THE WALLED ENCLOSURES AND THEIR RELATIONSHIPS WITH THE GENEALOGY OF THE LANDSCAPE

Author(s): Vale, Ana - Sanches, Maria Jesus (University of Porto - CITCEM)

Presentation Format: Oral

The designation “monument” has been used in the study of chalcolithic walled enclosures in the Iberian Peninsula as an alternative to “settlement” in a large part due to the functionalist and restrictive connotations of the latter as a place where everyday day activities took place (nevertheless it was considered a decisive socio-political arena). The definition of a monument however, seems to be linked to more wide concepts related to commemoration (remembering), ostentation (explicit manifestation of power), architectural endeavour, durability and even originality, connected with the social practices that inscribe these places in collective identities.

Walled enclosures, as monumentalised hills, are inscribed in a wider historical process of creation, and maintenance or transformation of monumental landscapes, which began in some regions, in the Neolithic. In this sense, each site has to be understood through the assemblage of relationships that are established with the territory in which it is situated. These relationships have to be examined at different scales - the physicality of the movements of human beings and other beings in the territory, visibility, and the detail of the architectural specificities of each site (which includes the materials used).

In this paper we aim to approach two walled enclosures, Crasto de Palheiros and Castanheiro do Vento (northeast of Portugal). These sites, which although are situated geographically close to each other and are in general terms contemporary (3rd millennium BC), and present similar archaeological materials, seem to exhibit different processes of monumentalisation of the place (distinct architectures) and of the landscape. Bearing in mind these premises and the presence or absence of previous monumentalization of the territories, we will inquire about the monumentalization process of the landscape during the 3rd millennium BC, questioning the theoretical framework in which we move, while at the same time considering the interpretative possibilities of these sites.

19 STORY STRUCTURES AND SUSTAINABILITY IN LATE NEOLITHIC MALTA: EXCAVATIONS AT THE SANTA VERNA MEGALITHIC SITE, GOZO

Author(s): Parkinson, Eóin - Stoddart, Simon (University of Cambridge) - Malone, Caroline - Brogan, Catriona - McLaughlin, Rowan (Queen's University Belfast)

Presentation Format: Oral

The Maltese Islands were the setting of a unique late Neolithic culture which saw the development of elaborate megalithic architecture and art that was sustained for over a millennium. The megalithic monuments of Malta are unparalleled in terms of their form, elaborateness and non-funerary function, expressing a strong regional identity. Traditionally, the development of these unique monuments around 3700 BC has been explained by their isolated island setting, although recent research under the FRAGSUS ERC project, investigating the fragility and sustainability of the Maltese Islands in prehistory, has formulated an economic and palaeoenvironmental context for the megaliths. Geoarchaeological and palynological research has indicated that environmental and economic stability was achieved through human manipulation of fragile soils and limited vegetation. Throughout the late Neolithic period in Malta ritual architecture was a key part of this landscape. Megalithic sites were placed according to certain geological and topographic constraints, and flourished until the Mid-3rd Millennium BC when both environmental stability and the megalithic culture declined. New excavations at the megalithic site of Santa Verna, Gozo, have shed light on the early beginnings of megalithic architecture on the Maltese Islands and uncovered, for the first time, the remains of a five-apsed megalithic structure equivalent in size and orientation to the nearby UNESCO world heritage site of Ġgantija. This paper will discuss the configuration and chronological development of the Santa Verna megalithic structure, placing the site in the broader context of Neolithic megalithism in Malta. The restructuring events of the site during the 4th Millennium BC reveal the actions of a society devoted to elaboration and maintenance of ritual architecture. Activity at the megalithic complexes, including their periodic embellishment, likely enacted social roles that enabled and maintained permanent agricultural productivity and other aspects of human life in the otherwise fragile Maltese landscape.

20 KAPELLENBERG – A YOUNG NEOLITHIC HILLTOP ENCLOSURE IN WESTERN CENTRAL GERMANY

Author(s): Gronenborn, Detlef (Roemisch-Germanisches Zentralmuseum, Mainz; Johannes-Gutenberg University, Mainz)

Presentation Format: Oral

Kapellenberg is an extensive hilltop site in the Rhine-Main-region of western Central Germany. The site is part of a complex settlement system in the wider region with a three-tiered settlement system of which Kapellenberg is in the top rank.

Kapellenberg today is still visible in the landscape by two earthen ramparts and corresponding ditches enclosing a ridge-like geologi-

cal formation extending from the Taunus hills into the Rhine-Main area. The site thus overlooks an extensive geographical entity and was once visible from afar. While a number of functions are being discussed for Young Neolithic enclosures, Kapellenberg and likely also similar sites in the wider Upper Rhine valley, may have served a primarily defensive purpose. Later, however, burial mounds have been erected on the site, and possibly other “ritual” activities connected to a circular enclosure of unknown age were undertaken.

Young Neolithic Kapellenberg existed for about 700 years, with a definite interior settlement for about 200 years. Hence, the site appears not to have been continuously and densely settled for the entire period of its Young Neolithic use, but may also have served as a refuge point for settlements from the wider region. A somewhat denser, but by no means packed, interior occupation is so far only documented for a period of maximally 200 years. At least for this period the site seems to have been embedded in a continent-wide economic network which channeled jade axes and salt, and possibly other commodities. The connecting routes of this network have been preserved throughout the millennia until today.

21 DORSTONE HILL: A MONUMENTAL NARRATIVE

Author(s): Thomas, Julian (Archaeology, SALC, Mansfield Cooper Building)

Presentation Format: Oral

Excavations at Dorstone Hill in Herefordshire, UK have been proceeding since 2011, and have revealed a remarkable sequence of Neolithic structures. Three timber buildings were constructed and then burnt down, and each replaced on the same footprint by a long mound. These mounds were strikingly different in architectural terms, with different chamber types, each apparently referencing different regional traditions: the long cairns of the Cotswold-Severn groups and the earthen long barrows of eastern England. Subsequently, a series of pits were cut into the eastern mound, containing human remains and fine lithic artefacts. Some while later a causewayed enclosure was constructed on the same hilltop, its plan flattened on one side so as to run parallel with the line of long mounds. Later, this was replaced by a palisaded enclosure. Over perhaps three or four centuries, these acts of construction and deposition were played out, each in relation to what had come before. In this contribution I will discuss Dorstone as an example of the ‘story structures’ referred to in the title of this session: the hilltop was a location whose special character accumulated over time, through a series of human interventions. I will consider the social implications of this construction of narrative in place, particularly in relation to the themes of origin, inception, continuity and durability.

22 BUILDING A SOCIAL STRUCTURE: ENCLOSURES’ ROLE IN SHAPING THE EARLY NEOLITHIC SOCIETY. A NORTHERN PERSPECTIVE

Author(s): Torfing, Tobias (Museum of Southwest Jutland)

Presentation Format: Oral

Enclosures consist of an enclosed space and something that encloses it. Thus, it separates something “inside” from something “outside” the delimitating structures. In this way, it is part of creating a very local separation within the Neolithic world. However, the enclosure is also part of a larger network of sites, from settlements and monumental grave structures to flint mines, fields, and other sites of exploitation of natural resources. At the enclosures, traces of many of these other sites are gathered, and then transformed or preserved, destroyed or changed, deposited permanently or removed to other sites.

This paper will explore how the Funnel Beaker enclosures are related to the sites around them, and how the activities at the enclosures are part of creating a larger Neolithic society. It will be argued that both the construction itself and the related activities were part of creating a sense of community, and that the enclosures were a central part of creating a more established Neolithic identity.

Through an analysis of three enclosures from Northern Jutland, it will be shown how the enclosures as phenomenon were established when a small, scattered population lived in forested lands. Furthermore, the paper will present a model for how enclosures were part of a change toward a structured landscape with paths and roads, and also a society with a more complex pottery style, more integrated agricultural practices, and a more focused settlement pattern.

23 THE LIVING AND THE DEAD - THE MONUMENTAL LANDSCAPE OF SOUTHWESTERN SCANIA, SOUTHERN SWEDEN

Author(s): Andersson, Magnus - Artursson, Magnus (The Archaeologists National Historical Museum)

Presentation Format: Oral

Extensive developer-funded excavations during the last 10–15 years in southern Sweden have included a relatively large number of destroyed and ploughed-out monuments, which has radically expanded our knowledge of Early Neolithic monumental graves and other types of ritually used constructions.

This paper is the result of a large-scale developer-funded excavation. It took place in the autumn of 2013 in Östra Odarslöv on the northeastern outskirts of Lund, southern Sweden. Here the ESS (European Spallation Source) is being built as part of a collaboration of several European countries to create a powerful new neutron source (<http://europeanspallationsource.se/>). Remains of houses, huts, pits, a wooden façade with an inhumation burial, three free-standing wooden façades, a stone-built façade and three long dolmens from the Early Neolithic were excavated, forming one of the largest and most complex sites of the period in southwest Scania. The excavation at Östra Odarslöv has changed the outlook on this particular part of southwest Scania. In this respect, it is an important part of our view of EN sites, landscapes and society in the region as a whole. Therefore we will also discuss houses

and huts, pits and pit depositions and monuments in various contexts in the region. The focus is on new results and perspectives regarding these phenomena.

24 DISCUSSION OF THE SESSION: BUILDING STORY STRUCTURES - EARLY MONUMENTALISM IN NEOLITHIC EUROPE

Author(s): Gebauer, Anne Birgitte (Danish National Museum) - Sorensen, Lasse (National Museum of Denmark, Copenhagen) - Teather, Anne (UCL Institute of Archaeology) - Valera, Antonio Carlos (NIA - ERA Arqueologia S.A., Archaeological Research Department)

Presentation Format: Oral

Presentations in session #515 of the most recent research on early Neolithic monuments from the Near East, the Mediterranean and Western Europe from the Iberian Peninsula to Scandinavia form the basis for a discussion of a series of core questions: Why construct monuments? What kind of society supports the early monument construction and what role do these monuments play in the early farming communities? How labor-intensive are the different types of monuments? Who organize the monument construction - who are structures built for? How are the monuments located in the landscape - in relation to habitation, other monuments and topographical features? Are there some common trends in the development of monument construction in Western Europe, the northern Funnel beaker group, as well as The UK and Ireland? What explains the variation in dimensions of mound and chamber as well as different choices of building materials both within and between regional groups? Does the apparent homogeneity in architectural concepts in Europe imply that the monument construction is the result of one big movement or are there independent regional developments? Are the younger monuments in northern Europe the result of an independent development? Does different types of megaliths or monuments in different areas represent the same ideas, were they built for similar reasons? For instance, non-accessible versus accessible tombs? More or less labor-intensive architecture?

a. THE NEVER-ENDING WHY - THEORIES ON NEOLITHIC MONUMENTALITY

Author(s): Brinkmann, Johanna (Institute for Pre- and Protohistoric Archaeology, Christian-Albrechts-Universität zu Kiel; CRC 1266 - Scales of Transformation)

Presentation Format: Poster

Many scholars have approached the question of monumentality in the Northern European Neolithic, either stressing socio-functional (e.g. territorial markers, inter-group competition, cultural memory, instruments of power), economic (e.g. recruitment of labour) or ideological functions (e.g. new belief system). While a certain degree of overlap exists in terms of the general idea concerning the significance of the megalithic monuments, it becomes apparent that specific premises are often predisposed, but not reflected (e.g. predominance of inter-group competition, surplus production, necessity for leadership, connection between megaliths and recourses). In most cases these premises are not proven by means of archaeological evidence, what should, however, be viewed as an essential principle in interpreting megalithic monuments. Furthermore, the question how labour was mobilized is rarely a subject of discussion. A general lack of supporting archaeological evidence – especially the absence of settlement data in many areas – is a major obstacle in the interpretation of the northern European megaliths as well as the often applied premise that burial practices are a direct reflection of social relations. By examining theories on Neolithic monumentality and discussing them against the archaeological record of three study areas (British Isles, Scandinavia and northern Germany) in the period between 4500-1800 BC, a comparative approach is applied. A focal point is the analysis of continuity and discontinuity in the archaeological record (e.g. megaliths, material culture, settlements, non-monumental burials, non-funerary monuments, subsistence) and the linking of theoretical concepts to the archaeological record using middle range theories (bottom up approach). The monuments in the study areas will be examined concerning the accessibility of the structures, the utilization, the condition of the human remains, the phasing and the position of the site in the landscape. With this approach a combination of factors can be analysed, which ultimately led to the construction of megalithic monuments.

b. FIRST MONUMENTALITY IN WESTERN EUROPE: THE 5TH MILLENNIUM CEMETERY OF FLEURY-SUR-ORNE (NORMANDY)

Author(s): Chambon, Philippe (CNRS; UMR 7206) - Ghesquière, Emmanuel (Inrap; UMR 6566) - Giazzon, David (Inrap) - Thevenet, Corinne (Inrap; UMR 8215) - Thomas, Aline (MNHN; UMR 7206)

Presentation Format: Poster

The cemetery is located the Orne valley (0,5 km) and littoral (15 km). The excavation carried out in 2014 covers a surface of 21 hectares. It made it possible to highlight 26 Passy type monuments 4700-4300 cal BC, 7 cairns from the following period Middle Neolithic 2 (4200-4000 cal BC) and three alignments of posts. By its extension and the hugeness of the monuments Fleury cemetery can be seen as important of the eponymous site of Passy (Yonne). One monument is the longest ever found in Europe: 372 m. Another noteworthy feature is the partially fossilized barrow of a large trapezoidal monument.

Three shapes of "Passy type" monuments were excavated: The smallest are in the form of isolated ditches or circles. Diameters or length varied from 3 to 12 m. Trapezoidal monuments are generally short (less than 20 m), but one is exceptionally monumental with 150 m length for 60 m width to the east. The most important ones are also the most numerous (14 monuments). They are made of parallel ditches. While the shortest do not exceed 13 m, length of two are comprised between 150 and 200 m and the two larger have more than 300 m long.

For all the monuments, only 16 individual and 2 double burials were excavated. Grave goods are scarce, but few graves include wealthy deposits composed of several ovicaprids, up to around 20 in one case.

The cemetery of Fleury-sur-Orne, together with the ones at Rots and Blainville-sur-Orne (Normandy) or those situated in the centre of the Paris Basin (Passy and Balloy), marks the origin of the funerary monumentalism in France, with giant barrows and first attempts of stone pavement, from 4700-4600 BC. Their dedicating to a single individual corresponds to an episode of strong hierarchy in Neolithic societies.

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ARE WE GETTING THE MESSAGE ACROSS? AN ASSESSMENT OF PUBLIC OUTREACH IN ARCHAEOLOGY

Theme: Archaeology and the European Year of Cultural Heritage

Organisers: Thomas, Ben (Archaeological Institute of America) - Lähdesmäki, Ulla (Pirkanmaa Provincial Museum)

Format: Regular session

Hundreds of professionals around the world are engaged in informing and educating the public about archaeology in non-academic or informal settings. These programs are organized by a variety of individuals and organizations including museums, historical societies, state and federal agencies, and private foundations. Each of these entities has its own objectives and goals and audiences. For this session we invite colleagues involved with archaeological outreach to tell us about the programs they organize, the goals of these programs, and the manner in which they assess and evaluate the impact of the programs. Do you think your programs are getting the message across to the participants? We hope this session will lead to the creation of a support network for archaeology outreach in which we can share ideas and support each other.

ABSTRACTS

01 DEVELOPING PUBLIC OUTREACH WITH ADOPT-A-MONUMENT PROGRAM AND PUBLIC EXCAVATIONS IN FINLAND

Author(s): Lähdesmäki, Ulla (Pirkanmaa Provincial Museum; University of Turku)

Presentation Format: Oral

Pirkanmaa Provincial Museum has developed activities which enable communities and citizens to participate in the care and use of archaeological and built heritage in Tampere Region, Finland. The paper presents two examples and their goals and discusses the achievements and assessment of their impact.

Adopt-a-monument program started in Tampere Region in 2008, after adopting the idea to Finland from Archaeology Scotland. Later on the activity has started in Ireland, too. In Finland the program engages an increasing range of communities to adopt archaeological or built heritage sites and develop own activities connected to them. The public has been interested both in more permanent and in short term activities such as cultural environment camps where the participants and heritage sites have varied. The program has recently spread in Finland when other public museums have started adopt-a monument in their region. Adoption restores visibility to often marginalized cultural heritage sites and enhances their values. The program aims to improve the vitality of environment and to promote heritage as a source of adopters' and public wellbeing. Part of the meaning of the program is to learn about the impact of the activity and the motives of the adopters. This means questionnaires and interviews to gain information about the success of the outreach. There is also a need to develop more assessment methods. Another example of public outreach is organizing public excavations. Cooperation with Pirkkala municipality in the vicinity of Tampere in 2017 enabled to carry out a popular excavation with volunteer participants and local schools. In this case the achievement has been assessed in a thesis in museology. The assessment continues in a comprehensive work shop about public excavations in general in Finland.

02 BETTER THAN DISNEYLAND!

Author(s): Søndergaard, Louise (Museum Skanderborg)

Presentation Format: Oral

The Museum of Skanderborg in Denmark invited everybody who had an interest, to take part in an excavation during the annual autumn school break. The object to be excavated was a poorhouse dating to the end of the 19th century. Usually something like that would not become the object of an excavation, due to its young age. However, the Museum of Skanderborg strives to do things differently. We aim to be significant, and to be an institution of value and pride to the local community. Being a small museum requires new means to make an impact.

The notion of a public excavation started to evolve, and the poorhouse seemed the perfect object. Apart from researching the history of the poorhouse in the local archives, planning was mostly on a practical level. Nothing on this scale had been done before in Denmark, so it was sort of like flying a kite. It was impossible to predict anything concerning finds, as well as participants!

It turned out to be a huge success. One family drove across the country to join the dig, and visitors as well as the press were con-

stantly present. When an 8 year old kid claims that this is better than Disneyland, you know you did something right.

My aim is to discuss whether a more informal setting might be furative. A setting in which the Museums also demand something of the participants, so that they get a notion of being important in this particular project. A joint venture to reach back and reveal history. Are we ready to share this mission? Can we gain anything from a shared mission? Is touching a couple of hundred people aiming too low, or it is worthwhile getting fewer people really engaged?

03 SERÓ ESPAI TRANSMISSOR: 5 YEARS SOCIALIZING KNOWLEDGE

Author(s): Bermúdez, Xavier - Belmonte, Cristina (iPAT Serveis Culturals)

Presentation Format: Oral

Seró Espai Transmissor is a centre that preserves and exhibits the archaeological remains of the megalithic monument of Els Reguers fe Seró (Artesa de Segre, Lleida, Catalonia). This site initially corresponded to a monument ensemble formed by at least three anthropomorphic statues-menhirs, dated probably in the late Neolithic. In a second phase, during the Chalcolithic period, the initial monuments were destroyed, and their stones used in the building of a dolmen. This site became an exceptional contribution to the megalithic statues world in the Iberian Peninsula and Europe.

The centre itself is a special building (with an awarded architectural design), thought to exhibit the remains through its two exhibition rooms. However, from the beginnings there was the clear idea that the centre had to accomplish a wider function than purely exhibit archaeological remains to specialized audiences: it had to promote the knowledge of the territory where it's placed, and to arrive to all publics and ages.

Apart from the regular guided tours, we propose activities like storytelling, night visits with lamps and astronomical observations, activities with kids, tasting of proximity products, historical re-enactment, lectures and special events. In addition to that, in the surroundings of Seró there are other megalithic monuments that can be visited, which we promote through hiking activities as a perfect complement to the visit of the museum.

The main goal of this entire activity program is to return to the society the knowledge of its past, but not as an inert fossil, but as an asset projected towards the future. Now that the centre celebrates its 5th anniversary, we want to discuss the successes and the failures to approach to the public an unknown museum with such specific remains, placed in a rural area in the interior of Catalonia.

04 BETWEEN TRADITION AND INNOVATION: FOSTERING PUBLIC ENGAGEMENT IN NORTH-EAST ITALY

Author(s): Benetti, Francesca - Chavarria Arnau, Alexandra (University of Padua)

Presentation Format: Oral

Since 2013 the Medieval Archaeology Group of the University of Padua has been fostering public engagement in archaeology, with a strategy of outreach activities for all the research projects. Our goal is not only to disseminate the results of the research carried out by the group, but also to create an active learning environment, in which the scholars and the public can collaborate to produce new knowledge. The activities mix some traditional elements of the outreach programmes (fieldtrips, guided tours, conferences, practical and hands-on activities) and innovative digital tools, with different levels of engagement and complexity (interactive maps, storytelling apps, WebGIS). An interesting research & outreach experiment has been the "participative summer schools", during which the archaeologists collaborate with the local communities to re-discover the history of the place, achieving remarkable scientific results. In order to understand the needs of the public as well as the impact of our programs, we have carried out several surveys (questionnaires and interviews). They have been useful to provide an evaluation of the outreach activities, but also to design future programmes tailored on the public expectations and interests. Apart from these traditional survey techniques, other indicators point to the success of these initiatives, e.g. the building of brand-new local amateur societies or spontaneous outreach activities designed by the local communities and directed to other audiences. Thus, the activities have stimulated a positive interaction and multiplied the initial dissemination goals, leaving the communities free to develop customised activities and to use scientific archaeological knowledge for their own purposes.

05 DO ARCHAEOLOGISTS STUDY DINOSAURS? EVALUATING THE EFFECTIVENESS OF ARCHAEOLOGY FAIRS AS A PUBLIC EDUCATION TOOL

Author(s): Thomas, Ben - Langlitz, Meredith (Archaeological Institute of America)

Presentation Format: Oral

Archaeology Fairs are popular public outreach activities but do they effectively inform people about archaeology and archaeological research? Do they generate public interest in the cultures and civilizations of the past? Since 2001, the Archaeological Institute of America (AIA) has organized over 20 archaeology fairs and interacted with thousands of people through these programs. Fairs bring together independent archaeological organizations representing a rich array of archaeological subfields to present their programs and resources to a local community in an interactive and engaging manner. The aims of the AIA archaeology fairs are to promote a greater public understanding of archaeology, raise awareness of local archaeological resources, and bring together proximate archaeological groups with a shared outreach goal. Through the fair, the partnering organizations, present activities that combine the excitement of discovery with sound archaeological thinking; emphasize the idea that archaeological discoveries are resources that help us better understand how people lived in the past and how human societies and communities functioned, developed, and

grew; and inform attendees about archaeology and cultural heritage by having them participate in hands-on activities, by observing demonstrations of ancient technologies, and by talking to the experts presenting the various programs. The popularity of this program as an outreach event is increasing among archaeological groups across the US and abroad. In 2016, the AIA conducted a survey of organizations around the world that host fairs. Our goals were to understand why people organized fairs and what their goals were for these events. In this paper we examine the results of the survey and discuss whether archaeology fairs are effective in informing and educating people.

06 “MUGS WITH HORNS”: A CONTEST TO CHALLENGE THEM ALL AND WITH CREATIVITY ENGAGE THEM

Author(s): Osti, Giulia (University of Bologna)

Presentation Format: Oral

“Mugs with Horns” (Tazze con le Corna) is a co-creative archaeology-themed contest at its second edition; this format was created specifically for the visiting schools at the Bronze Age excavation of Pilastrì (Emilia Romagna, Northern Italy), a community archaeology project running since 2013. The site, open to the public during the entire excavation campaigns, experienced an increasing turnout of schools participating in the educational activities through years. The good feedback received from the accompanying teachers and the interest shown by the local community encouraged the development of new and more inclusive outreach activity, aiming to foster something more than learning about the past. The latter was one of the strongest grounds for the creation of the two editions of the contest, which have seen the participation of schoolchildren, teachers, local artists, writers and other stakeholders of the Pilastrì project. In particular, the last edition was oriented toward the exploration of the values and the meanings associated to archaeology by the various participants.

Starting from an analysis of the stories and the related drawings realised by the participants, this paper will aim to assess the potential of this kind of creative and shared experiences involving more than one segment of public. Some interviews to the participants of both the editions will provide more specific qualitative data to broaden the understanding of the personal value-making process.

07 THE X-FACTOR OF A VIKING AND THE IMPORTANCE OF A WELL-DEFINED STRATEGY

Author(s): Bagge, Merethe Schifter (Museum Skanderborg)

Presentation Format: Oral

In the spring of 2017, Museum Skanderborg in Denmark was fortunate to receive foundation grants for excavation of an elite Viking age burial – the Fregerslev chamber grave. In the grant application the museum, besides means for excavation, conservation and natural science, also applied for the ability for outreach.

The museum wanted to personalize the Viking and the purpose for the outreach was to tell the story about the Viking, combining it with general knowledge in archaeological methods. At the same time, it was important to make the excavation public – make it possible for everyone to follow the archeological work, and to sense the excitement. The Viking got his own homepage and was constantly on social media. Every day in three weeks the museum had a guided tour, some days even several tours. In three weeks, 5000 people visited the excavation, and some of them came from abroad. Right from the start, we had the medias full attention, and the site reached many newspapers all over the world.

The project was a success, but still, even though we in many ways did have a well-defined strategy, there were many lessons learned during the process. Outreach in this way is time and resource demanding, but it is indeed worthwhile. It was a profit for both visitors and the participants in the project.

08 “BLOWIN’ IN THE WIND”? REACHING UNSPECIFIED TARGET AUDIENCE

Author(s): Ilves, Kristin - Åstveit, Leif Inge (University of Bergen)

Presentation Format: Oral

During 2017 and 2018, the University Museum in Bergen, Norway, excavates 12 Stone Age sites within the Sotrasambandet project – the most comprehensive infrastructure archaeology project ever undertaken by the Section for Cultural Heritage management at the Museum. The focus of the investigations is on questions of stability and change of the Stone Age settlement and material culture in the coastal areas. Because of the archaeological fieldworks being conducted in close vicinity to Bergen – the second largest city in Norway – face-to-face interaction with the public, including guided tours for schools, is an essential part of the project. However, uncommonly for the (at least Norwegian) infrastructural archaeology projects, Sotrasambandet also has a full time employee for digital public outreach during the field season. Among different digital approaches, a lot has been invested in innovating audio-visual approaches to the dissemination of archaeological methods and techniques, as well as challenges and results – for the general public, students and professionals alike, locally as well as regionally, but also internationally. This kind of wide understanding of an audience, symptomatic for archaeological public outreach in general, is laudable, but presents its own challenges and the question is raised whether it overshoots the set goals. Within the Sotrasambandet project, this issue is tackled by building up the audio-visual work in different levels in order to reach out to different backgrounds and expectations (cf. https://www.facebook.com/pg/Arkeologi-på-Sotrasambandet-605203116343314/videos/?ref=page_internal). In addition to outreach through short movies, the project also employs a range of more conventional digital methods for bridging the gap between infrastructural archaeology and academic archaeology as well as archaeology and the public.

09 AT EYE LEVEL WITH THE PUBLIC - COMMUNICATION AND CULTURAL MEDIATION IN THE KURATORIUM PFAHLBAUTEN

Author(s): Loew, Carmen (Kuratorium Pfahlbauten)

Presentation Format: Oral

Outside of museums and larger research institutions little attention was payed on professionalism in communication and cultural mediation in the field of archaeology in German speaking countries.

In fact, and for a variety of reasons, archaeologists have often been forced to cover both areas themselves for a long time. Therefore knowledge transfer and public relations were more like an additional burden for the researchers and have not been seen as the specialized and independent full-time jobs that they are.

As a small entity with a big mission, in the Kuratorium Pfahlbauten we are breaking new ground for these important tasks. Funded for the management, communication and mediation of the UNESCO World Heritage "Prehistoric Pile Dwellings around the Alps", we created our own expertise in Austria. We carry out an active community management and gradually develop the social control in preservation in favor of the pile dwellings hidden in the water. We use social media extensively for communication and run a successful science blog to make our work as transparent as possible.

Also in cultural mediation we explore new ways, for example, in showing our exhibitions in the sense of a reproductive discourse in the cultural mediation specifically in public places where they are not necessarily expected or streaming our underwater excavations live in the internet. In all our core tasks, such as conservation, mediation and research, an intensive involvement of the broad public, as required by the World Heritage Convention and the Budapest Declaration, is visible. Some of our achievements can be substantiated by specific data, but we have not yet found adequate evaluation methods that meet our needs for all our activities. For this we would like to exchange our experiences in the session.

10 HOW TO IMPLEMENT AN ARCHAEOLOGICAL PUBLIC OUTREACH PROJECT IN THE MIDDLE OF A CONSTRUCTION SITE

Author(s): Azzopardi, Amanda (Rio Göteborg Natur och Kulturkooperativ)

Presentation Format: Oral

In 2013 the largest urban archaeological excavation ever undertaken on the west coast of Sweden began in Gothenburg's Gamlestad. The town of New Lödöse (Nya Lödöse) at the mouth of Göta river, which lay here between 1473 and 1624, has been excavated until last year 2017. It was previously excavated in the 1910s and 1960s, ever since then, the town has been almost forgotten, and no visible remains of the town are visible today.

According to the Swedish Heritage Law, organizations carrying out major archaeological projects have the obligation towards the County Administrative Board (Länsstyrelse) and the general public to communicate and share the archaeological process on site, new findings, and research results.

In fact, as a prerequisite for an excavation permit, the local County Administrative Board required a plan for a public outreach program aimed at a broad target groups, such as youths, the elderly, students, and immigrants. These target group requirements changed from year to year, as did the annual budget for the outreach plan.

We will discuss our goals and methods of implementation, and will bring forward the difficulties that come with running a public outreach project within a large archaeological excavation performed over the course of many years in an urban situation. Who did we manage to reach, what help and obstacles did we meet along the way? We will evaluate our performance and how the message got across, and look closer at how we assessed the results of Nya Lödöse's public outreach program.

519 MEDITERRANEAN CULTURAL DIFFUSION IN PREHISTORY

Theme: Mediterranean seascapes

Organisers: Templer, Michael (University of Neuchâtel) - Polcaro, Andrea (University of Perugia)

Format: Regular session

The Mediterranean last dried out 5 million years ago. When the Straights of Gibraltar were breached, large fauna got 'stranded' on the newly created or recreated islands. Many of these species, attained of island-dwarfism, survived unmolested until mankind began to visit and colonise the islands. During prehistory coastal circulation and maritime transportation carried people, produce and ideas throughout the Mediterranean at an accelerating pace, marking a steep uptick during the formative period of proto-urban societies in the Levantine areas of the Mediterranean Basin, when their needs grew in terms of raw materials and goods to satisfy the demands of the new elites. This session presents such instances from Prehistory, prior to the advent of Protohistory, of human movements, maritime and terrestrial transport, and cultural transfers, along, around and across the Mediterranean. The presentations can be based on archaeological, linguistic or other forms of scientific evidence.

01 INDIRECT AND NOT-SO-INDIRECT EVIDENCE FOR PRE-NEOLITHIC NAVIGATION IN THE MEDITERRANEAN BASIN

Author(s): Templer, Michael (University of Neuchâtel)

Presentation Format: Oral

The earliest evidence for navigation and maritime contacts in the Mediterranean dates back to at least the Middle Palaeolithic, based on cultural remains discovered in island settings, which can typologically be dated to cultural facies, or evidence for the hominid exploitation of island resources, such as the extermination of animal species, most parsimoniously attributable to human agency. There is no archaeological evidence for the type(s) of craft used prior to the Neolithic, other than in riverine contexts, although several hypotheses have been put forward, and we will show some of the craft-types which have been suggested. In this introductory presentation, we will run through some of the hypothesised and hard evidence for maritime movements and contacts prior to the Neolithic. The hypothesised evidence is largely based on similarities in the lithic traditions between mainland geographic regions which are most likely to have been the subject of maritime contacts, whilst the hard evidence is based on archaeological, cultural and non-endemic faunal remains in island settings. Other forms of evidence are island resources found in stratified archaeological contexts on the mainland, or in similar other island settings. A final form of evidence is the evidence for the exploitation of maritime resources which necessitated the use of sea-going craft.

02 TRANSVERSE GROOVED STONES AS MARKERS OF ANCIENT PATHWAYS IN EURASIA (PROTO-NEOLITHIC TO EARLY BRONZE AGE)

Author(s): Usacheva, Irina (Tyumen Scientific Centre of Siberian Branch of the Russian Academy of Sciences)

Presentation Format: Oral

Among the archaeological artefacts there are items that are markers of transcultural pathways. These are the prestigious forms of raw materials (e.g. amber, obsidian, jade), religious objects (e.g. women's figurines), direct and indirect evidence of the spread of new technologies (e.g. geometric microliths, cereals, potter's wheel). This study is devoted to transverse grooved stones or transverse grooved artefacts (TGA). They originated in southwestern Asia in the 13th millennium BC, from which point in time they spread to the Mediterranean coasts of Africa and Europe but mostly to Northern Eurasia (the steppe, forest-steppe and semi-desert zones). TGA have been determined to have the same use in all the territories in which their existence has been attested. The author supports the hypothesis that the high efficiency of TGA as straighteners of cane and reed shafts under heating explains the scale at which these artefacts spread, demonstrating the high adaptive abilities of reed arrows for open landscapes.

This paper highlights the TGA expansion over time and space, and clearly shows the gradual changes in the area of distribution and the particularities of their distribution in different territories. Interesting results reveal the overcoming of the mountain, desert and water barriers. We have discovered that the spread of TGA has been carried out along different paths. Moreover, grooved stones along each of these transmission routes are represented by their own decorative and morphological types. Obviously, every route has given rise to a separate transit flow, indicating at least the direction of interaction, and at best tracing the movement of particular cultural groups bearers of the tradition. Genetic research could provide a more accurate answer to this question.

03 EVOLUTION OF NAUTICAL AND SAILING KNOWLEDGE AND TECHNIQUES IN THE EASTERN MEDITERRANEAN BETWEEN THE 4TH AND THE 2ND MILLENNIA BC

Author(s): Polcaro, Andrea (Perugia University)

Presentation Format: Oral

The 4th millennium BC in the Near East was a period of rapid evolution in coastal navigation, as clearly shown by the archaeological evidence, artistic representations and artefacts. In particular, the initial urbanization process occurring in the communities located along the eastern fringe of the Mediterranean Sea allowed the evolution of a long-distance sea trade and the increase of contacts between different cultures. This paper will aim to analyse the historical and archaeological data related to the evolution of sailing and nautical knowledge and techniques in the Near East, trying to delineate the role of the Levantine communities in the Mediterranean Basin. Between the 4th and the 2nd millennia BC, in fact, connections between the eastern, central and western Mediterranean communities increased, bearing not only technologies but also beliefs and ideologies, changing the way of thinking about the Mediterranean Sea, which was no longer the end of the known world, but the main and most important way to share natural resources and goods. Moreover, the evolution of the craft for sea-going navigation during the Chalcolithic and the Bronze Age periods will be presented to understand their effect on the Mediterranean cultural relationships and their role concerning the spread of urbanization.

04 SACRED AREAS IN THE MEDITERRANEAN BASIN: THE MAIN SANCTUARIES FROM THE 4TH MILLENNIUM BC

Author(s): Caselli, Alessandra (Sapienza University of Rome)

Presentation Format: Oral

During the 4th millennium BC, several socio-economic transformations occurred throughout the Southern Levant and other Medi-

terranean areas, so that the settlements pattern was different compared to that of the previous period, as shown by archaeological data from excavations. The urbanization process started partly because of these socio-economic and cultural changes in the organization of the communities. Cultic activities are the expression of the culture of societies and knowledge of these is essential to understand the community daily life. The paper analyses both topographical and architectural aspects of the main southern Levantine and Mediterranean sanctuaries from this period, as well as the material culture and ritual practices, in order to investigate the social evolution through the ritual aspect and to understand the role of the cultic aspect in the urbanization process. Moreover, during this period several megalithic structures appear both in the Mediterranean basin, such as Malta, and in the Southern Levant. Through the examination of the archaeological data, this paper seeks to recognize differences due to isolation of the different sub-regions from one another, and/or similarities, which might suggest that there were contacts and connections between the different areas of the Southern Levant and other Mediterranean areas during the 4th millennium BC, at least from a cultic standpoint. New data from Jebel al-Mutawwaq excavations will be included.

05 ALONG THE SHORELINE. WAYS OF CONNECTION BETWEEN THE LEVANTINE COAST AND THE EASTERN MEDITERRANEAN DURING THE EARLY BRONZE AGE

Author(s): Casadei, Eloisa (Sapienza University of Rome)

Presentation Format: Oral

During history, the Mediterranean Sea has represented a crossroad of peoples and cultures. In some cases, this net of interconnections provoked the spread of styles and ideas that can be followed along the shores of the Mediterranean coasts. Some of these manifestations can be clearly identified in the pottery repertoire of the Early Bronze I on the Levantine coast, where traces of entanglement can be detected in the ceramics horizon dated to that period. The creation and diffusion of ceramic vessels provide information regarding three aspects of the social life. On the one hand, the quantitative and spatial analysis of the shapes indicate social practices of food behaviour, from the storing to cooking and consuming of solids and liquids. Secondly, the recurrence of specific decorations or styles gives information regarding the fashion and the preferences expressed by people. Finally, the sharing of a particular “ways-of-doing” in a wider area strongly determined the circulation of shared working practices. The paper intends to analyse the Early Bronze ceramics repertoires of the coastal sites along the easternmost shore of the Mediterranean Sea, from the Southern Levantine coast to Lebanon and Southern Syria, with the aim to recognize and isolate the presence of shared elements that can better define the bond between the different coastal communities.

06 THE GROTTA DELLE VENERI (APULIA, ITALY): A LONG-TERM EVIDENCE OF CULTURAL CONNECTIONS

Author(s): Giardino, Claudio - Tiberi, Ida (University of Salento)

Presentation Format: Oral

The Grotta delle Veneri (“Venuses Cave”) at Parabita (Lecce, Italy) is one of the most important prehistoric caves of Italian prehistory. It is located in Apulia, in the Salento peninsula, and it is known for its extraordinary artistic manifestations related to Palaeolithic hunter-gatherers, including two Venus figurines that gave their name of the cave. Its importance lies in its very long history, that includes the recent phases of the Neolithic as well as the Metal Ages. After the Palaeolithic, the cave was in use from the beginning of the 6th millennium BC until the Bronze Age, even if with differences in terms of intensity and use during the different periods.

Indicators of wide-ranging contacts have been identified, including symbolic artefacts, pottery vessels with shapes and decorations that testify cultural and trade connections with both the West and the East, particularly with Sicily and with the Eastern Adriatic regions. They document the capability of the Salento communities to participate in the wide circulation of ideas, goods and knowledge that permeated the Mediterranean from the 6th to the 2nd millennium BC.

Obsidian and copper items were recovered in the Grotta delle Veneri, uncommon artefacts produced with non-local raw materials. The metal objects were made of pure copper and arsenic-copper alloys.

Only a few caves maintained, during the Southern Italian Copper Age, an exclusively cult function, such as Grotta delle Veneri: the votive deposition of valuable objects may have expressed the desire to preserve the beneficial relationships with the spirits of the underground world.

07 CIRCULATION OF GOODS, CIRCULATION OF IDEAS: PERSPECTIVES FROM COPPER AGE CAMPANIA, SOUTHERN ITALY

Author(s): De Falco, Maria (Durham University) - Aurino, Paola (Università degli Studi di Napoli, L'Orientale; Soprintendenza Archeologia, Belle Arti e Paesaggio per l'area metropolitana di Napoli)

Presentation Format: Oral

The aim of this paper is to highlight the development of connectivity in Copper Age Southern Italy, with a focus on Campania Region, in light of the contemporary trends in Europe and the Mediterranean. The fourth and third millennia BC are characterized across the Mediterranean and Europe by the development of specific local cultural entities that appear at the same time highly interconnected over short and long distances.

Whether manifested in the exchange of goods, human mobility or the circulation of ideas, these processes of broader cultural contacts can be detected in the material record. In this context, Copper Age Southern Italy represents a good example of small and

large-scale connections. Local cultures emerged here, and expanded in some cases, with different patterns and intensities, into the central area of the Italian peninsula. They show both synchronic and diachronic links at a regional scale and allochthonous influences. These external influences involve the exchange of goods, the circulation of specialised know-hows, raw materials or foreign models and styles. Influences from the Eastern Mediterranean (e.g., the Balkans and possibly the Aegean), Northern Italy and Central Europe (e.g., Bell Beaker culture) can be detected in different sets of material cultures (e.g., pottery, bone ornaments, metals).

520 ARCHAEOMETALLURGY IN THE 21ST CENTURY

Theme: Theories and methods in archaeological sciences

Organisers: Rose, Thomas (Institute for Geosciences, Goethe University Frankfurt) - Salzmann, Eveline (Institute for Geosciences, Goethe University Frankfurt) - Birch, Thomas (UrbNet, Aarhus University) - Odler, Martin (Czech Institute of Egyptology, Faculty of Arts, Charles University, Prague)

Format: Regular session

Archaeometallurgy, as the archaeology of the production and use of metals, benefits from advances in a wide range of disciplines. However, no major methodological advances have been reported since the introduction of lead isotope analyses. Nevertheless, significant progress has been made in related fields and new approaches are emerging. Among them the most prominent are “Big data”, quantitative modelling, and newly accessible isotope systems, as they were (among others) summarised by Kristian Kristiansen as the “third science revolution”. Additionally, self-perception of archaeometallurgy is challenged by today’s wide spread performance of smelting and melting experiments as they have a strong influence on the perception of archaeometallurgy in the public and its definition.

We welcome contributions from the wide spectrum of archaeometallurgical research (analytical and archaeological investigation of metals and their by-products, experimental approaches, technological studies, mining archaeology, modelling, etc.). The main goal is to find answers to the question, how archaeometallurgy as an archaeology of metals in the 21st century should be. How will it be able to advance beyond the established ways? What are the recent developments and emerging research fields? What are today’s limits, and how can they be pushed forward? Can we formulate research program(s) for the next decades?

ABSTRACTS

01 RECENT DEVELOPMENTS IN ARCHAEOMETALLURGY

Author(s): Salzmann, Eveline (Deutsches Bergbau-Museum Bochum) - Rose, Thomas (Goethe University Frankfurt) - Birch, Thomas (Centre for Urban Network Evolution - Urbnet, Aarhus University) - Odler, Martin (Charles University, Prague)

Presentation Format: Oral

Archaeometallurgy has undergone extensive transformations since the beginning of the new millennium. New options arise from advances in analytical chemistry, information technology, and the focus on relating social inequalities with access to metals. The field has moved from classical data production to more holistic. The integration of natural science and humanities is essential for the emergence of interdisciplinary projects, where separated areas of expertise have existed in the past.

Concerning analytical methods, technological progress during the last decades has pushed forward the scientific limits. Higher precision and accuracy of analytical techniques now enables measurements of new isotope systems, particularly stable metal isotopes. Although still at their beginnings, these isotope systems have the potential to analyse new aspects of the metallurgical process. Additionally, in-situ techniques and portable devices keep evolving towards higher precision whilst minimising alteration of archaeological objects.

High performing computer systems have opened up the possibility for, so far, impossible or impracticable approaches, especially in statistics and modelling. They also allow re-evaluation of published data and the handling of large complex datasets with unprecedented convenience. Integration of the archaeometallurgical evidence with the more “traditional” written and iconographic sources can help in the mutual understanding of humanities and archaeometallurgy.

Research questions have also moved from the mere reconstruction of provenance, exchange, and technology towards a more comprehensive understanding of metals in society. This includes not only the general availability and use of metals from all walks of life but also, for example, the practical feasibility on metal working.

This presentation introduces the session with an overview of current developments in the wide field of archaeometallurgical research. It aims to interconnect the following presentations and to pinpoint future developments in Archaeometallurgy.

02 AN AWFUL LOT OF NUMBERS – THE BENEFITS OF DOING LARGE NUMBERS OF ANALYSES

Author(s): Jouttijarvi, Arne (Heimdal-archaeometry)

Presentation Format: Oral

Analysis of metal objects has often focused on the interpretation of individual objects. However, there is a much greater opportunity to look at similarities and differences if you analyze a larger material, thereby gaining a better understanding of the archaeological contexts.

By analyzing all parts in fittings from officers belts found in the weapon sacrifice at Nydam, it could be statistically shown that fittings from the individual belts could be grouped. Similarly, it could be shown that the parts found in different parts of the sacrifices at Ejsbøl likely belonged to the same belts, and that sacrifices thus had to be simultaneous.

Analyzes of all objects from graves in cemeteries, could indicate links, and therefore possibly kinship between the deceased. At the same time you will be able to distinguish groups that may be of different families, or separated in time.

The use of different metals, in relation to the context, such as social status, can also give an impression of the symbolic value added to the individual metals and alloys. Small pieces of metal in graves have also been found to originate from certain types of Roman vessels, and thus likely to be a symbolic representation of, for example, a Hemmoor bucket.

03 BETWEEN THE RIVERS: A GIS-BASED DATABASE OF METAL DEPOSITS, MINING, AND CONSUMPTION AREAS OF THE EARLY BRONZE AGE NEAR EAST

Author(s): Salzmann, Eveline - Hauptmann, Andreas - Klein, Sabine (Deutsches Bergbau-Museum Bochum)

Presentation Format: Oral

Advances in modern information technology facilitate processing of data in an unprecedented way. As more data become available the more complex the situation becomes. Modern geographic information systems enable the handling of extensive data amounts and the statistical analysis of these. GIS is a powerful tool to combine archaeological, archaeometallurgical, and geological data to analyse the connection of resources, production, and consumption areas.

The presented database was compiled to understand the inter-regional connections of the ancient city of Ur and the Mesopotamian metal trade. In the famous cemetery of Ur tremendous amounts of metals (gold, silver, copper, bronze) were discovered dating to the Early Bronze Age, mid 3rd millennium BCE (Woolley 1934). However, Mesopotamia is an area completely void of metal resources indicating that the metals must have been imported (Zettler & Horne 1998). Textual and archaeological evidence suggests inter-regional exchange over vast distances as far as Anatolia, Levant, and Egypt to the west and as far as the Indus Valley, and Central Asia to the East (Wilkinson 2014). Thus, the presented GIS-based database comprises geological data of copper, lead-silver, and tin ore deposits from the Eastern Desert of Egypt across Anatolia, Zagros, Oman, Hindu Kush, and Pamir to the Aravalli range in north-western India. The database was compiled by intensive literature research and digitising of published maps, descriptions of locations, and coordinates of metal deposits, ancient mining areas, and archaeological sites with the software of QGIS 2.18 Las Palmas.

This approach aims to building bridges between archaeological evidence, analytical data, and geological investigations. This study contributes to a better understanding of exchange networks, availability of raw materials, and consumption patterns in the Early Bronze Age Near East.

04 COMPARING LEAD ISOTOPE DATA OF METAL ARTEFACTS WITH THE ARCHAEOLOGICAL EVIDENCE - RECONSTRUCTING EARLY BRONZE AGE NETWORKS TO SCANDINAVIA

Author(s): Noergaard, Heide - Vandkilde, Helle (Aarhus University, Dep. Culture and Society) - Pernicka, Ernst (Curt-Engelhorn-Zentrum für Archäometrie, Mannheim)

Presentation Format: Oral

For the Bronze Age in northern Europe (NBA) two possible transport routes stand opposite each other; on the one hand a continental route that connected the Alps, Central Europe and the NBA; and on the other hand, a maritime route linking Mediterranean civilisations with Atlantic communities in Northwest Europe. The reconstruction of both routes is based either on archaeological evidence or on isotopic evidence (of relatively small numbers of artefact samples). Concerning the earliest period of the Bronze Age, little is known about the significance, the extent and the direction of this metal trade. However, as early as 2100 BCE, societies in the hotspot zone of Denmark and Scania began to use metal. This is even more interesting as this region has not exploited metal ores of their own; therefore, the origin of the metal used is of key significance to understanding and modelling the cross-European interconnectivities that were established through the necessity of trading. The Nordic region was for the very first time fully dependent on one crucial exogenous resource. The related change within the political economy surely resulted in the establishment of the Nordic Bronze Age.

Within a comprehensive approach, using source critical the stylistic and technological characteristics of artefacts investigation, trace elemental compositions and Lead isotope data the provenance of these early metals in southern Scandinavia will be determined. The data consist of around 550 samples evenly distributed over the first 600 years of the period in which the Nordic Bronze Age emerges. The combination of the archaeological evidences, as the stylistic and technical affiliation of the analysed artefacts to specific social traditions, their chronological affiliation with the trace element and lead isotope pattern allow a reconstruction of the actual networks far more realistic than hitherto known.

05 THE INTERPRETATION OF LEAD ISOTOPES. CASE STUDY OF BRONZE AGE COPPER ALLOY ARTEFACTS FROM COLLECTION OF THE EGYPTIAN MUSEUM OF LEIPZIG UNIVERSITY

Author(s): Odler, Martin (Czech Institute of Egyptology, Faculty of Arts, Charles University, Prague) - Kmošek, Jiří (Department of Chemical Technology, Faculty of Restoration, University of Pardubice) - Fikrlé, Marek (Nuclear Physics Institute, Academy of Sciences of the Czech Republic) - Kochergina, Yulia (Czech Geological Survey)

Presentation Format: Oral

This paper presents an archaeometallurgical study of a corpus of copper alloy artefacts currently deposited in the collection of Ägyptisches Museum – Georg Steindorff – der Universität Leipzig. Main focus is on the interpretation of lead isotopes, which is in case of ancient Egypt a complex problem. The set of 86 artefacts (full-size vessels, full-size tools and their models, mirrors, razors and tweezers) is dated to the 3rd and 2nd millennium BC. The artefacts have been found in Early Dynastic tombs of the cemetery of Abusir; in the tomb of the last king of the Second Dynasty, Khasekhemwy, at Abydos; in a cemetery of 5th and 6th Dynasty officials at Giza, and in a C-Group and New Kingdom cemetery at Aniba in Nubia.

Lead isotope analyses were carried out using a MC-ICP-MS spectrometer. Other applied methods were focused on the production technology and chemical composition: ED-XRF, SEM/EDS and NAA. Newly acquired analytical data from NAA and MC-ICP-MS analysis were compared with available results of trace elements composition of copper alloy artefacts and lead isotope ratios of copper and lead ores from neighbouring regions.

Measured data need to be interpreted on the basis of knowledge of historical and archaeological context and the final interpretation is a result of discussion of scientists with the specialist in Egyptian history and archaeology. The measured data are not enough, especially in the case of one of the early civilization with complex approach to gathering of sources. Discussions and combined multidisciplinary methodology in the interpretation of data results in more secure data that reflect and contribute to the contemporary state of research of history and economy of ancient Egypt.

06 TRACKING NATURAL AND ANTHROPOGENIC PB EXPOSURE TO ITS GEOLOGICAL SOURCE

Author(s): Evans, Jane (NIGL, British Geological Survey; Department of Archaeology, Nottingham University; Department of Archaeology, Leicester University) - Pashley, Vanessa (NIGL, British Geological Survey) - Madgwick, Richard (School of History, Archaeology and Religion, Cardiff University) - Neil, Samantha (Department of Archaeology, Durham University) - Chenery, Carolyn (NIGL, British Geological Survey)

Presentation Format: Oral

Human Pb exposure is derived from two sources: (i) natural uptake through ingestion of soils and typified by populations that predate mining activity and (ii) anthropogenic exposure caused by the exposure to Pb derived from ore deposits. Currently, the measured concentration of Pb within a sample is used to discriminate between these two exposure routes, with the upper limit for natural exposure in skeletal studies given as 0.5 or 0.7 mg/kg in enamel and 0.5/0.7 µg/dL in blood. This threshold approach to categorizing Pb exposure does not distinguish between the geological origins of the exposure types. However, Pb isotopes potentially provide a more definitive means of discriminating between sources. Whereas Pb from soil displays a crustal average $^{238}\text{U}/^{204}\text{Pb}$ (μ) value of c 9.7, Pb from ore displays a much wider range of evolution pathways. These characteristics are transferred into tooth enamel, making it possible to characterize human Pb exposure in terms of the primary source of ingested Pb and to relate mining activity to geotectonic domains. We surmise that this ability to discriminate between silicate and sulfide Pb exposure will lead to a better understanding of the evolution of early human mining activity and development of exposure models through the Anthropocene.

07 OF RISING TIDES, SINKING BOATS, AND THE BIRTH OF THE METALLURGIST-ARCHAEOLOGIST: A WEAR ANALYSIS PERSPECTIVE

Author(s): Dolfini, Andrea (School of History, Classics and Archaeology)

Presentation Format: Oral

According to Kristiansen (2014), archaeology is rapidly heading towards a 'third science revolution'. Spearheaded by major advances in the fields of 'Big Data', quantitative modelling, ancient DNA, and stable isotope analysis, archaeological science is not just revolutionising the way we research the past, but also the way we think about it. Yet, as with all disruptive changes, the new wave of scientific applications to archaeology is creating losers as well as winners. Killick (2015) and others, in particular, have argued that the rising tide of archaeological science has not lifted all boats. Weighed down by lack of investment and a long-standing rift separating 'technohead' scientists from social archaeologists, archaeometallurgy would sit on the wrong side of history, its boat slowly sinking. This paper presents a more optimistic narrative arguing that, in the last ten years, archaeometallurgy too has witnessed the birth of scientist-archaeologists (Martinon-Torres and Killick in press). By mastering with equal rigour archaeological theory and archaeological science, these individuals are taking forward metallurgical studies at no lesser extent than colleagues from more 'fashionable' subjects. Drawing from the author's own research into early metal tools and weapons, the paper shows that metalwork wear analysis has brought about a quiet revolution in archaeological science through combined cutting-edge laboratory analysis and critical experimentation with replica objects. As discussed in the paper, this method is significantly contributing to the development of archaeometallurgy as a mature field of research fit for the 21st century.

08 THE BRONZE AGE SICKLES. RESEARCH ON THE IMPACT OF THE PRODUCTION AND SURFACE PREPARATION ON THE MICROSTRUCTURE OF THE OBJECTS

Author(s): Nowak, Kamil - Baron, Justyna (Institute of Archaeology University of Wrocław) - Puziewicz, Jacek - Ziobro, Małgorzata (Institute of Geological Sciences University of Wrocław)

Presentation Format: Oral

Archaeological experiments focusing on the reconstruction of metallurgical activities related to the younger parts of the Bronze Age allow us to discuss the issues of casting production in prehistory. Making a series of castings allows to observe many interesting relationships, including the influence of liquid metal over the surface of the casting mould or the influence of material of casting mould over the surface of the cast object. The combination of "classical" experimental archaeology with specialized archaeometallurgical methods make it possible to obtain a whole spectrum of new information.

The presented results are related to the experiment, which allowed to answer questions, connected with the production methods and strength of bi-valve clay casting moulds. During the experiment clay moulds were made, then two types of sickles were cast. It was investigated the influence of high temperature on the surface of casting moulds as well as the possibility of comparing the mould negative with the cast. The main goal of the activities was to perform archaeometallurgical analyzes using scanning electron microscopy (SEM). Observations have shown that sharpening and giving the right hardness of sickles blade required multiple annealing and forging. The reconstructed sickles served to make a series of samples that were taken from the part of blade. The first samples were made of sickles just removed from the form, i.e. unused. Subsequent samples were taken from sickles, which blade was prepared (finishing operations) by cold forging and annealing. A series of samples were collected from sickles with a forging surface, forging and then annealed, and with forging-annealed-forging surface.

Obtained observations create a database that contains images of the microstructure of objects at various stages of production. The results can be compared with the analyzes made for samples taken from the original items.

09 THE LUBNOWY WIELKIE HOARD: ARCHAOMETALLURGY AS A MEANS OF UNDERSTANDING THE PHENOMENON OF BRONZE DEPOSITS IN THE LATE BRONZE AGE

Author(s): Maciejewski, Marcin - Miazga, Beata (Institute of Archaeology University of Wrocław) - Kosiński, Tymoteusz (National Centre for Nuclear Research) - Szczepański, Łukasz (Museum in Ostróda)

Presentation Format: Oral

In Polish archaeology – though not only – in past decades hoards were treated as assemblages of precious artefacts taken out of their cultural context and consequently their investigation was focused on the typology of particular relics. One particularly important challenge therefore is the formulation of an appropriate methodology, which on the one hand would make use of the research potential of contemporary archaeology and on the other, place these enigmatic finds in the appropriate social context. This is of particular significance in the view of the rapid growth in numbers of such finds, as has been the case in recent years.

Dated to the end of the Bronze Age (ca. 950-800/750 BC), the hoard from Lubnowy Wielkie, is an example of a find indeed subjected to such a multi-aspectual methodology. Apart from typical archaeological analysis for the purposes of a fuller understanding of the documented find, research was also undertaken in archaeometallurgy by means of microscopic analysis, investigation of the chemical composition of alloys (ED-XRF and SEM-EDS) and computer tomography (research in part conducted in association with the E-RIHS.PL consortium).

The above mentioned assemblage is composed of embellishments featuring a very coherent style. In all, there are four objects that could have been worn by the one and the same person. The analyses conducted had the aim of verifying hypotheses occurring in archaeological works, ones contending such an assemblage could have been the property of one person and that it was created at the same time in respect to an important life event such as a rite of passage. Further research questions concern the technology of making the ornaments. The research methodology was chosen in respect to the archaeological specificity of this hoard in particular, in the context of frequent interpretative propositions.

10 LIFE CYCLES OF METALS AND PEOPLE IN THE IRON AGE - SOURCING AND RECYCLING OF COPPER BASED ALLOYS

Author(s): Danielisova, Alzbeta (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic) - Bursak, Daniel (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic; The City of Prague Museum)

Presentation Format: Oral

Exact data on trends in using materials in prehistory are solid part of the archaeological narration and their importance is indisputable. There are quite numerous studies on the provenance and production of the copper and its alloys in periods from the beginnings of metallurgy or from the areas like Mediterranean or the Alps, however, the case for Iron Age remains largely obscure. For decades there was a quiet assumption that primarily local deposits were exploited and the proximity to sources of polymetallic ores significantly influenced the settlement structure.

We would like to present first results of the project dealing with the archaeometry of coppers alloys in Central Europe (Czech Republic) between the 4th and the 1st century BC. Previous research brought to light possible sources of Mediterranean and partly also Alpine origin for the 2nd - 1st century BC. Now we need to establish a wider perspective in the use of materials spanning the periods

before the founding of the oppida. Intensive and well organised bronze production seem to have developed during the 3rd century BC within the newly established agglomerations while before decentralised and possibly heterogeneous organisation of production is predicted.

Our methodology involves evaluation of bulk and trace composition, accompanied by isotopic (namely Pb) tracers. Analysed finds come from different stages of the life cycles of metals, including the technical ceramic. We would like to follow the line of introduction and standardisation of different alloys, the question possibly related to the primary acquisition and/or recycling of various sources. Even in periods when traditional provenance questions are much more difficult to answer, we believe that mixing of sources tends to follow certain trends that can be traceable by available analytical methods. By establishing these “trends” the archaeometallurgy can help to explain historical events even within a wider historical perspective.

11 A COMPOSITIONAL STUDY OF CYPRIOT COPPER ALLOY ARTEFACTS DATING TO THE MIDDLE BRONZE AGE USING PORTABLE XRF SPECTROSCOPY

Author(s): Charalambous, Andreas (Archaeological Research Unit, University of Cyprus)

Presentation Format: Oral

The present analytical study concerns the interdisciplinary investigation of more than 400 copper alloy artefacts, coming from over 50 tombs of the Early-Middle Bronze Age cemetery of Lapithos Vrysi tou Barba on the north coast of Cyprus. The excavation of the tombs took place in 1913 and 1917, but the material was never formally published. In 2016, a new project, coordinated by Dr. Jennifer Webb, for the study of the Lapithos Vrysi tou Barba material was launched, in order to identify and publish this very important and “forgotten” assemblage. The chemical analysis of the copper alloy artefacts, performed by a portable handheld XRF for the determination of their chemical composition and the alloy types used for their manufacture, is part of this project. The majority of the analyses were performed on clean surface areas, free of corrosion layers. The assemblage consists of spearheads, knives, axes, chisels, awls, needles, pins, tweezers, rings, earrings and spatulas. Some specialized studies, including the chemical analysis of a limited number of metal objects from Lapithos, were published between 1960 and 1990. However, this important assemblage of primarily Middle Bronze Age Cypriot metalwork has never been analysed as a whole and thus little is known about the alloys used to produce these artefacts. The results of the analyses show that, beyond the use of unalloyed copper and arsenical copper alloys for the manufacture of the artefacts, a significant number of objects were made of copper-tin alloys (in some cases of high tin). This indicates that the metalsmiths of Lapithos had significant access to tin, which is not present in Cypriot ores, during the Middle Bronze Age and suggests that the north coast of Cyprus was more actively engaged in the Eastern Mediterranean metals trade than previously thought.

12 WHAT TO EXPECT FROM TIN ISOTOPES? POSSIBILITIES AND CONSTRAINTS FOR TIN PROVENANCE RESEARCH BASED ON EXPERIMENTS AND ANALYTICAL DATA

Author(s): Berger, Daniel - Brüggmann, Gerhard (Curt-Engelhorn-Zentrum Archäometrie Mannheim) - Pernicka, Ernst (Curt-Engelhorn-Zentrum Archäometrie Mannheim; Institut für Geowissenschaften, Ruprecht-Karls-Universität Heidelberg) - Marahrens, Janeta (Curt-Engelhorn-Zentrum Archäometrie Mannheim)

Presentation Format: Oral

Tin isotopes have become gradually more important for archaeological concerns within the last 20 years and great hopes are still pinned on them in finding a solution for the ‘tin problem’. In fact, several research groups tried to use the tin isotope composition of archaeological metal artefacts to track the geological sources of Bronze Age tin. However, a lot of aspects have not adequately been addressed until recently such as the establishment of an isotope database of tin deposits and the behaviour of tin isotopes during the pyrometallurgical processing of tin. As a consequence no conclusions on the origins of tin were possible. An interdisciplinary project funded by the European Research Council had the ultimate goal to overcome these deficiencies by enlarging the database of tin ores considerably and by analysing the tin isotope composition of artefacts and experimental samples systematically. The aim of the present talk is to give a brief summary of the outcome of the project and to outline the potential of tin isotopes for tin provenancing. Besides the comparison of tin ore data from different regions throughout Eurasia, the influence of the pyrometallurgy of tin (tin ore smelting, bronze casting and melting) on the isotope composition on the base of experiments will be addressed. At the end of the talk practical archaeological examples will illustrate how to handle and interpret tin isotope data and what to conclude from them in general.

13 COUPLED TIN AND LEAD ISOTOPIC COMPOSITIONS IN „APA-TYPE” SWORDS FROM APA, HAJDÚSÁMSON, NEBRA AND JUTLAND

Author(s): Brüggmann, Gerhard - Berger, Daniel (Curt-Engelhorn-Zentrum Archäometrie Mannheim) - Nessel, Bianka (Institut für Geowissenschaften, Universität Heidelberg) - Pernicka, Ernst (Institut für Geowissenschaften, Universität Heidelberg; Curt-Engelhorn-Zentrum Archäometrie Mannheim)

Presentation Format: Oral

Of significant chronological and cultural-historical importance are the typological parallels between “Apa-type” swords, considered to be the earliest bronze swords in continental Europe. They have a wide distribution from the Carpathian Basin to Scandinavia suggesting a long-distance exchange network in the Early and Middle Bronze Age. In this context, it is interesting to investigate if the

composition of the tin bronze alloys would confirm this relationship or if a different material was used to produce them.

We have determined the tin and lead isotope ratios of “Apa-type” swords and associated bronze objects from the Apa, Hajdúsámson and Nebra hoards and from several locations in Jutland. Previous studies showed that chalcopyrite is the main copper ore mineral used to produce the copper for the bronze. The lead isotopic compositions suggest that the copper for the objects from the Apa and Nebra hoards as well as those from Scandinavia most likely derived from the Mitterberg main lode, that of the Hajdúsámson hoard suggests a source in the Slovakian Ore Mountains.

Remarkably, the lead isotope composition correlates negatively with the stable isotopic composition of tin, suggesting a mixing line where the objects from the Scandinavian hoards define the end members. An explanation could be that the bronze of the artefacts were produced by smelting a variety of bronze ingots or scrap metal originally made by alloying different charges of copper ores with homogeneous charges from two different tin ores.

This hypothesis would imply that the “Apa-type” objects were produced during the same alloying charge, and might suggest the presence of a single or a group of linked workshops, which used a specific metal source, probably from a small-scale supply during a limited period of time.

14 21ST CENTURY RESEARCH AGENDA FOR IRON ARCHAEOMETALLURGY

Author(s): Godfrey, Evelyne (Uffington Heritage Watch)

Presentation Format: Oral

A simplistic evolutionary model prevails in the literature on iron metallurgy, which has never been comfortably supported by the archaeological evidence. Early iron technology is portrayed as progressing in stages from initial use of “natural” meteoric iron, to “pure” smelted iron, and later steel, higher carbon steel, and ultimately cast iron. In fact, there is no technical connection between isolated hammering of rare metallic iron rocks fallen from the sky, and systematic smelting of hematite, for example, ore in a bloomery furnace. Likewise, there is no reason that knowledge of liquid-state copper production should lead to solid-state bloomery iron smelting. In the late 20th century, iron archaeometallurgical research settled on ‘Anatolia/North Syria’, ‘around 1400 BC’ and ‘Hittites’ as the geographical, temporal, and cultural outer limits for the origins of European iron technology. Recent archaeological fieldwork, supported by radiocarbon dates, indicates that iron production in northern India on the other hand, was taking place in the earlier part of the 2nd millennium BC, predating the Bronze-Iron transition in Anatolia and the Eastern Mediterranean. The excavated evidence suggests that iron smelting technology developed in the Indian subcontinent as early as 1900 BC. This paper describes a current programme of conventional and neutron-based analyses to characterise the earliest-dated Iron Age smelting slag, furnace lining, ore fragments and iron artefacts from archaeological sites in the Ganges Plain region of India. A research agenda for iron archaeometallurgy in the 21st century is proposed, that looks beyond Europe’s Christian ‘Cradle of Civilisation’, and follows well-trodden trade routes further east, to the civilisations of the Indus and Ganges river-valleys.

15 PROVENANCING IRON ARTEFACTS WITH IRON ISOTOPES: NEW INSIGHTS FROM BOG IRON ORES

Author(s): Rose, Thomas (Institut für Geowissenschaften, Goethe Universität Frankfurt) - Télouk, Philippe (ENS-Lyon, Université Lyon) - Marschall, Horst (Institut für Geowissenschaften, Goethe Universität Frankfurt) - Klein, Sabine (Forschungsbereich Archäometallurgie, Deutsches Bergbau-Museum Bochum)

Presentation Format: Oral

The potential of stable iron isotopes for provenance studies was investigated for the first time by Milot et al. (2016). These authors concluded that it is possible to reconstruct ore provenance using iron isotopes of the metal, if combined with elemental or isotopic tracing methods. They postulated that iron isotopes do not fractionate during smelting and that the iron isotope composition supports the archaeological provenance hypothesis of their artefacts. Yet, they admit that applicability of their approach is currently limited, because iron isotope information on iron ore deposits is scarce despite the large number of such deposits. In particular, bog iron ore deposits, which were widely exploited in prehistoric times had not been characterised for their iron isotope compositions to date.

We thus present iron isotope data of two bog iron ore deposits near Krefeld (Germany) and metallurgical products of a smelting experiment conducted with ore from one of the two deposits. First, our data support the conclusion of Milot et al. (2016) that smelting does not alter the initial iron isotope composition. Second, we found indication of a relatively wide spread of the iron isotope data within a single deposit in both bog ore deposits. This could result in misleading positive matches for unknown artefacts originating from other metal sources, as seen for the artefacts analysed by Milot et al. (2016).

Our small study contributes considerably to the applicability of iron isotopes for archaeometry, but still the spread and evolution of iron isotope signatures of iron ore deposits in general and bog iron in particular is not yet fully unravelled.

References:

Milot, J., Poitrasson, F., Baron, S., Coustures, M.-P., 2016. Iron isotopes as a potential tool for ancient iron metals tracing. *Journal of Archaeological Science* 76, 9–20.

16 STUDYING MEDIEVAL RUSSIAN ENCOLPIO CROSSES OF THE 12TH–16TH CENTURIES AD BASED ON NEUTRON AND SYNCHROTRON RADIATION

Author(s): Greshnikov, Eduard - Govor, L. (National Research Centre “Kurchatov Institute”) - Zaytseva, Irina (Institute of Archaeology Russian Academy of Sciences) - Kovalenko, E. - Kurkin, V. - Murashev, M. - Podurets, K. - Blagov, A. - Yatsishina, E. - Glazkov, V. (National Research Centre “Kurchatov Institute”)

Presentation Format: Oral

Studies by Mary Curie have opened a new branch of science – nuclear physics. Investigation in medieval Russian encolpio crosses of the 12th–16th centuries AD in National Research Centre “Kurchatov Institute” used non-destructive nuclear physical methods to obtain information about the material, manufacturing technology, and the contents of their internal cavities

Cast bronze pendant crosses decorated with niello and relief images of saints from the archeological excavations in Moscow and in the vicinity of Suzdal (200 km east of Moscow, Russia) with movable hollow leaves fastened with a locking pin had the internal cavity intended to hold relics (holy relics). Neutron and synchrotron tomography methods combined with elemental (neutron radiation analysis) and phase (neutron diffraction) analysis all this makes it possible to obtain information on the manufacturing of crosses and holy enclosures (if any) in encolpios before opening them. It is possible to detect organic substance (fragments of the leaves and stem of a plant) inside reliquary crosses from Moscow and Suzdal (by neutrons). It was possible to reveal the decor lines making up the image under the oxide layer and traces of the “lifetime” repair of the Suzdal encolpio – a through locking pin-rivet installed frontally through the drilled leaves. Neutron tomography investigation of the encolpio cross from the Novodevichy monastery revealed a relief inscription cast in the upper part of both leaves under a thick layer of oxides. All investigations were non-destructive without any sampling or opening leaves of the crosses.

17 SOLID STATE ELECTROCHEMISTRY: A NEW ANALYTICAL TOOL FOR STUDYING ARCHAEOLOGICAL METAL

Author(s): Melchor Monserrat, Jose (Museo Arqueologico Burriana) - Doménech-Carbó, Antonio (Department of Analytical Chemistry, University of Valencia) - Doménech-Carbó, Maria Teresa (Institut de Restauració del Patrimoni, Universitat Politècnica de València) - Piquero-Cilla, Joan - Montoya-Dura, Noemi (Department of Analytical Chemistry, University of Valencia) - Pasies-Oviedo, Trinidad (Museo de Prehistoria de Valencia)

Presentation Format: Oral

During the last decades, the voltammetry of immobilized particles (VIMP) has emerged as a solid state electrochemical technique able of provide analytical information on a variety of solid materials. This technique is of particular interest in the study of cultural heritage because of its inherently high sensitivity, only demanding amounts of sample at the nanogram level which, attached to inert electrodes in contact with suitable electrolytes display well-defined voltammetric responses providing qualitative and quantitative compositional information.

Application to archaeological metals results in the possibility of: a) sample screening and grouping in order to establish provenances and/or manufacturing techniques; b) defining authentication criteria; c) dating. Such studies are based on the record of the voltammetric response of nanosamples from the corrosion layers, simply extracted by pressing a graphite electrode onto the surface of the object. The obtained voltammetry is representative of the composition and in depth distribution of corrosion products which in turn depend on the composition, metallographic structure and ‘corrosion history’ of the archaeological artifacts. When series of samples for which a reasonably common corrosion history can be assumed were treated, voltammetric data can be used, via bivariant and multivariate chemometric techniques for the above archaeometric purposes. Reported methods include the authentication and dating of lead, dating copper/bronze and leaded bronze artifacts and discriminating monetary emissions. Recent advances include characterization and dating of gold.

18 SHAPING THE DISCIPLINE OF ARCHAEOMETALLURGY

Author(s): Lauridsen, Line - Hoggard, Christian Steven (Aarhus University) - Birch, Thomas (Aarhus University; Centre for Urban Network Evolutions - UrbNet)

Presentation Format: Oral

Over the last thirty years, advances in archaeometallurgical studies have enhanced and improved our understanding of past production methods, metal-working processes and, more generally, the behaviour of past metal-makers and -users. While so, these advances have focused on the chemical make-up of the produced artefacts, and focused less on the morphological composition of the metal objects. Those that have considered morphology have focused on lineal distances, ratios and angles, and not the overall shape and shape features of these artefacts. As all metal artefacts are affected by processes of cultural transmission, and imposed shapes, an understanding of global shape allows us to know the craftsmen behind the tool. Here through the use of an iron-based case study we present how advances in the discipline of geometric morphometrics (GMM) allow archaeologists to move away from subjective typological assessments of metal objects, the main methodological driver prior to chemical analyses, and provide a robust framework for understanding their shape variance. We conclude by discussing the potential integration of chemical analyses with shape variables, through multiple regression and multivariate methodologies, and how such permits an investigation into how chemical composition relates to shape, and how high-quality shapes and forms relate to their chemical make-up.

a. METALLURGY IN THE EASTERN IBERIAN PENINSULA DURING THE LATE IRON AGE (3RD - 1ST CENTURIES BC)

Author(s): Quixal Santos, David (University of Valencia)

Presentation Format: Oral

In this paper we will focus on the mining and metallurgy in the Eastern Iberian Peninsula during the Late Iron Age (3rd to 1st centuries BC), concretely in the interior of the province of Valencia (Spain). In this area we have documented three huge territories controlled by three important Iberian oppida: Kelin (Caudete de las Fuentes), Edeta (Llíria) and La Carència (Torís).

We have compiled abundant information about the processes of exploitation and transformation of the metal from the 4th/3rd centuries BC to the Imperial period. The main activity was the siderurgy, but we have also many evidences of working with other metals such as lead or bronze. We have documented surface and gallery mining, presence of reduction and forging slags in numerous sites, existence of metallurgical furnaces and a big number of tools. We will also present all the new discoveries from the siderurgic furnace of Los Chotiles (Sinarcas), which has been excavated during the summer of 2017. This area gives us a great opportunity to study all the phases of the metallurgic processes and all the kind of slags and remains which are generated by the ironworks, being especially interesting because they were developed during the pre-roman times.

521 THE MEDITERRANEAN IN THE NORTH: THE MATERIAL EVIDENCE OF DISTANT CONTACTS, AD 1000-1800

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Russow, Erki (Tallinn University) - Blake, Hugo (Royal Holloway, University of London) - Coll Conesa, Jaume (Museo Nacional de Cerámica)

Format: Regular session

Contact between the relatively two distant regions – the Mediterranean and northern Europe – stretches back to later prehistory (e.g. the amber trade) and Antiquity. Well known is the incorporation of Britannia into the Roman Empire, as is the archaeologically well-documented interaction between Romans and the northern barbarians. The same cannot be said about the late medieval and early modern periods. Although there are some specialist studies on the distribution of Italian and Iberian pottery, less has been published on other kinds of information, such as the archaeological evidence for pilgrimages, the trade in foodstuffs, textiles and raw materials, to name a few aspects of the multifaceted connection between southern and northern Europe. Yet there is a considerable amount of new archaeological data, collected in the last two or three decades of extensive rescue archaeological research around the North and Baltic seas that can illuminate how complex were the links those living in the North and the Mediterranean.

This session welcomes contributions that discuss the archaeological evidence of Mediterranean material culture in medieval and early modern northern Europe. Our main aim is to consider the impact it had on the communities living around the North and Baltic seas: how extensive is the artefactual and ecofactual evidence collected from urban or rural sites, how well were “all things Mediterranean” socially distributed, what might be the reasons behind their use and how may they have influenced local societies?

ABSTRACTS

01 NEW TRACKS ON OLD PATHS. NEW LIGHT ON IMPORTED MEDIEVAL SPANISH CERAMICS IN FLANDERS

Author(s): Coll Conesa, Jaume (Museo Nacional de Cerámica „González Martí“) - De Clercq, Wim - Poulain, Maxime (University of Gent) - De Groote, Koen (Flanders Heritage Agency)

Presentation Format: Oral

Some recent Spanish medieval ceramic finds in Flanders offer a new understanding of the trade between the Iberian territories and the north. Some of these finds have never been documented before. We can point out the presence of dateable productions from the time of the Muslim rule of the Iberian Peninsula, connecting with similar rare finds from the European interior. Among them, the normal or moulded-relief luster earthenwares from the workshops of Almería or Málaga, under the Muslim government, or the painted blue and luster on white from Paterna and Manises, belonging to the Kingdom of Valencia, stand out. On the other hand, Valencian ceramics dated to the first half of the 14th century decorated with geometric elements combining a very pale blue and a golden green color that are usually found in the contexts before the black death (1348), or used as a parietal decoration in buildings dated from the second quarter of the 14th century, are also showing an early connection that has not been recognized until now due to the lack of reliable chronological references. The present communication will focus on these ceramic finds and will reflect on the new perspectives and interpretations about its historical significance.

02 THE TUSCAN CONNECTION: MONTELUPO POTTERY AND GLASS IN THE NORTH

Author(s): Blake, Hugo (Department of History, Royal Holloway, University of London)

Presentation Format: Oral

By the middle of the 15th century brightly decorated Renaissance maiolica made in Montelupo, the pottery-making centre which served Florence, came to north-west Europe. At the turn of the century its presence is more evident. Its distribution outside Tuscany peaked between about 1575 and 1625, reaching places around the Baltic, as well as the North Sea. By the middle of the 17th century it was no longer taken beyond the Mediterranean.

In the 18th century Montelupo specialized in making terracotta, glass, kitchenware and low-quality maiolica. The last two had a Mediterranean market, whereas the terracotta jars and glass flasks were used to carry edible olive oil all over the world, in particular to Britain and its colonies and to the Netherlands, where the jars have been found. It is not yet known if they got to the Baltic too.

This paper will examine the historic contexts in which these two trades developed. The peak in maiolica tableware seems closely linked to the descent in the early 1590s of Dutch and Hansa ships to Tuscany's main port Livorno in order to supply Polish grain to alleviate a Mediterranean-wide famine. Its subsequent decline followed the affirmation of tin-glazed pottery production in north-west Europe.

The best-quality Italian 'salad oil' was produced in the Republic of Lucca and its trade in jars was fostered by Livorno, which became the second or third largest port in the Mediterranean and the principal commercial base and port of call in that sea for north-European shipping. Another good quality was traded as 'Florence' oil, put in straw-wrapped glass flasks and sold by the chest, all three of which were made in Montelupo. Although well-documented in written and iconographic records, these flasks and – not surprisingly – their straw wrapping and wood containers have not yet been identified.

03 GOING UP NORTH: DISTRIBUTION AND CONSUMPTION PATTERNS OF PORTUGUESE CERAMICS IN NORTHERN EUROPE (1580-1680)

Author(s): Casimiro, Tania (IHC/IAP NOVA University of Lisbon)

Presentation Format: Oral

The presence of Portuguese ceramics, either tin glaze wares or coarse red wares is widespread in Northern Europe, from Spain to the Baltic Sea. So far Portuguese wares have been found in every North European country with port cities. Some cities, due to their close relations with Portugal, something which can be observed in their frequent presence in Portuguese port books, trading all type of products, present more quantity than others. Large commercial urban centres such as London, Plymouth, Amsterdam or Hamburg or even smaller cities like Gothenburg are key points in the study of Portuguese ceramics trade in the North of Europe and some of them with specific studies about such collections. It is possible that the cities with lesser amounts may have acquired these objects by indirect trade instead of a direct connection with Portugal. However a more general approach is needed when considering the trade of such commodities discussing their importance on an overall trade.

This paper intends to discuss the distribution models of these ceramics, from Lisbon, Coimbra or Vila Nova into Northern Europe not from a specific site or nation's point of view but their importance in a general trade system without forgetting their importance from a consumption point of view.

04 THE MEDITERRANEAN IN WESTERN NORWAY 1000-1600

Author(s): Hansen, Gitte (University Museum of Bergen, University of Bergen)

Presentation Format: Oral

The paper presents exotic 'Mediterranean' finds from a large and a small medieval town on the west coast of Norway. The first town is Bergen, the largest trading hub of the North Atlantic during the middle ages. The second town is the Borgund kaupang located by today's Ålesund. The Borgund kaupang was a small urban community, with three or four churches it was the largest church centre between Trondheim and Bergen. The place has traces of activity dating back into the Viking Age and was abandoned probably by the 16th century. The paper gives the first broad overview of medieval materials and objects with a Mediterranean origin or inspiration. Examples of such are silk yarn, runic inscriptions, religious portable material culture, table and kitchen wares of pottery and glass. Objects and materials that relate such exotic contacts between the far south and the peripheral northernmost part of Europe are usually considered very rare and exclusive. But how rare were these objects and materials really? The biographies of objects and materials are discussed; how did they end up in western Norway? Some may have been personal belongings travelling with their owner, others may have come to the north as regular commodities, whether as mass produced goods or more exclusive one-of-a-kind. Did they come here directly? Did the character of contact between the south and the north change over time? Who were the consumers in terms of social identity? Are there differences in consumption patterns when comparing between the large town Bergen and the small Borgund kaupang? The paper aims to contribute to the discussion of similar materials across the North Atlantic and Baltic Seas.

05 MEDITERRANEAN IN THE BALTIC C. 1200–1700: THE WHAT, WHERE, WHEN AND WHY

Author(s): Russow, Erki (Tallinn University, Institute of History, Archaeology and Art History) - Gaimster, David (Auckland Museum)

Presentation Format: Oral

Physical/archaeological evidence on late medieval and early modern Mediterranean material culture in the northern Europe has been recognised and described since mid-19th century, most notably pottery and glass, to a lesser extent also other artefact groups or foodstuff. A lion's share of this work concentrates to the finds from NW-Europe, especially the British Isles and the Dutch-speaking areas where we can find great number of publications summarising, contextualising and synthesising items coming from the southern Europe. However, the situation in the Baltic is by and large different. Even though there is by now quite a few studies handling relevant finds on a local scale, less has been written on a regional or even more general level, one example being a paper on late medieval tin glazed wares in the Baltic, published almost 20 years ago. Yet the archaeological information on the direct or indirect contacts with Mediterranean regions during the late medieval and early modern period grows constantly, due to the rescue /salvage archaeology projects accompanying large scale reconstruction work of urban space as well extensive infrastructure renewal in the countryside all around the Baltic. This has led to a steady increase of finds, including things considered up to now as exotic, exclusive, rare etc because of their Mediterranean background. The present paper will try to give an overview on different kind of artefacts (pottery, glass, textile etc) with different kind of functional background (tableware, containers of foodstuff, religious portable material culture etc) coming from southern Europe with the aim to show the diversity of the archaeological evidence and to consider the main reasons behind the movement of things from Mediterranean towards the Baltic between 1200 and 1700.

06 IBERIAN CERAMICS IN SOUTHERN SCANDINAVIA C. 1100-1600

Author(s): Langkilde, Jesper (ROMU, Roskilde Museum)

Presentation Format: Oral

The Iberian Peninsula was an important source for a number of luxury goods, such as textiles, oil, rice, wine, spices, sugar, almonds, figs and raisins, traded to northern Europe in the late middle ages. For Scandinavia the written information about this trade is sparse and mostly derives from German Hanseatic sources. Important information has also come in recent years from archaeobotanical studies. Both written accounts and botanical finds, however, can be problematic as sources for knowledge on the spatial and social distribution because of their somewhat arbitrary preservation. Another important source for knowledge on trade has since the beginning of medieval archaeology been the study of distributions of pottery, based on its widespread use and high preservation in archaeological contexts, although not unproblematic either. Since the work of Hurst in the 1960's studies of medieval Iberian ceramics in northern Europe have mainly covered the British Isles, the Low Countries and to some extent Norway, while the rest of Scandinavia and the Baltic sea area are much less explored. In this paper finds of Iberian ceramics and their distribution in mainly medieval Denmark will be presented and discussed, based on a pioneering work published in 2015. The Iberian ceramics reaching southern Scandinavia – most of it probably through the Hanseatic network - comprises either luxury tableware imported in its own right, or the much more easily overlooked transport vessels, which reached the area as containers for foodstuffs, thus holding information on the distribution of these goods, as a supplement to the written and archaeobotanical evidence. A survey of Iberian ceramics in southern Scandinavia also serves as comparative material for studies in other parts of the Baltic region.

a. EARLY TIN-GLAZED EARTHENWARE PRODUCTION IN NORWICH, UNITED KINGDOM

Author(s): Goffin, Richenda (Suffolk Archaeology)

Presentation Format: Poster

Preliminary findings on pottery and kiln-related material excavated from close to the site of the original tin-glazed production centre set up by Jasper Andries and Jacob Jansen in 1567.

These potters had fled from Flanders following the political and religious unrest in the Netherlands during the of Philip II and his regents. They hoped to be able to resume their pottery manufacturing in peace across the North Sea, in a city where there was already a large community of Dutch refugees. Jasper himself was of Italian extraction, as his father Guido was an Italian potter who had moved to Antwerp, thus facilitating the spread of this technology northwards.

The session will include illustrations and photos of the main forms and decorative types of tin-glazed wares found in the infill of a well located close to the area where the potters worked. The illustrations will also include kiln furniture as well as other types of ceramics which may be experimental products made alongside the tin-glazed wares.

There are considerable similarities with assemblages excavated in the Netherlands as well as with material found at Aldgate, in London, which is where the potters moved to after their short-lived stay in Norwich. The assemblage can be considered as another stage in the dissemination of tin-glazed earthenware manufacture focussing on the area around the North Sea.

Theme: Mediterranean seascapes

Organisers: Gori, Maja (Ruhr-University Bochum) - Recchia, Giulia (University of Foggia)

Format: Regular session

In the last 10 years, discussion of inter-Adriatic interactions during late Prehistory and their importance in Mediterranean maritime networks has dramatically increased, going beyond the regional specialism that characterized the research in this area. By adopting a holistic and trans-regional approach and by focusing on different socio-cultural and economic modes of exchange, this sessions aims at:

- Critically discussing the potential of descriptive Social Network Analysis and explorative Agent-Based Modeling in reconstructing Adriatic and eastern Ionian seascapes in later Prehistory.
- Assessing developments and transformations of interaction patterns across the Adriatic and Ionian Seas in a diachronic perspective.
- Investigating the impact of seaborne connectivity in shaping the landscapes and seascapes of the Adriatic and eastern Ionian coasts.

In particular, the application of different models to the available archaeological evidence will be tested in order to revisiting our assumptions on the socio-economic functions of maritime connectivity, the actors involved in these networks on the one hand, and, on the other hand the role and use of archaeological data in modeling.

To give more room to cross-discussion and dialogue, two keynote speakers will open the session, so to sparkle comparative discussion on different aspects of the theme discussed: Tom Brughmans – “Network science and agent-based modelling for studying maritime connectivity: an overview”. Francesco Iacono – “Social Network Analysis in the Late Bronze Age Adriatic”

ABSTRACTS

01 THE POTENTIAL AND CHALLENGES OF NETWORK SCIENCE FOR THE STUDY OF ANCIENT MARITIME CONNECTIVITY

Author(s): Brughmans, Tom (School of Archaeology, University of Oxford)

Presentation Format: Oral

What determines the usefulness of particular formal network methods for scholars studying ancient maritime connectivity? Is it the convenient representation of entities such as islands, ports and the past interactions between them as dots and lines? Or is it the good fit between the past phenomena of trade, transportation and communication, with their abstraction as network concepts? In this presentation I will argue that although these reasons might be sufficient to lead scholars to consider using formal network methods for addressing their research aims, they are not sufficient to motivate the adoption of specific network techniques. Through applied examples I will illustrate how it is unhelpful for us scholars of ancient maritime connectivity to use formal network methods as a hammer to hit every nail we can find with, just because we can. Instead, specific formal network methods should preferably be selected in light of their ability to lead to insights that other approaches cannot offer. In order to identify such appropriate formal methods, we need to make our archaeological theories about past maritime connectivity explicit by asking and answering the following question: according to my archaeological theory, how did the relationships I conceptualise in my research context affect the existence of other relationships and the opportunities of conceptualised entities (agents/nodes)? An explicit and detailed answer to this question will reveal what (if any) formal network methods have the potential of leading to unique insights.

I will illustrate this research process through a study of Roman tableware distributions as proxy evidence of Roman economic integration. An exploratory network analysis of a large dataset of Roman tableware led to largely uninformative results. However, an agent-based network model representing archaeological theories of maritime connectivity combined with using the tableware data to falsify models led to unique insights.

02 SOCIAL NETWORKS DURING THE LATE BRONZE AGE AT THE GATES OF EUROPE

Author(s): Iacono, Francesco (McDonald Institute for Archaeological Research, University of Cambridge)

Presentation Format: Oral

Over the last decade or so, the use of networks (both as formal methods and as a more general metaphor for human interactions) has become extremely widespread in archaeology and in the broader humanities. This has suited particularly well certain contexts such as the Mediterranean of the late prehistory and early prehistory, for which connectedness is indeed paradigmatic. Within this larger context, the southern Adriatic of the Late Bronze age (roughly 1750-1000 BC) undoubtedly represented a place of thriving connections at different geographical scales ranging from those operating at a regional level, to the long-range ones, effectively joining the central Mediterranean with the Aegean palatial (and then post-palatial) societies on the one side, and Northern Italy and Europe to the other. Because of this, such a context represents an ideal benchmark for discussing the methodological potential of network methods for the analysis of the archaeological record. In this paper I will try to do so critically re-assessing some of my previous work on this topic in this area suggesting, at the same time, some potential future directions. Operationally the main focus will

be on mobile artefacts but other aspects will also be taken into account. Thematically instead, a specific attention will be devoted to the seldom explored aspect of the interplay between interactions analysed through networks and societal differentiation using of an explicit theoretical model based on different branches of radical social theory.

03 NETWORKING ACROSS THE ADRIATIC IN LATER PREHISTORY: UNDERSTANDING CHANGING MODES AND PURPOSES OF LONG-TERM CROSS-CULTURAL INTERACTIONS

Author(s): Recchia, Giulia (University of Foggia, Department of Humanities) - Cazzella, Alberto (Sapienza' University, Rome, Department of Antiquities)

Presentation Format: Oral

Cross-cultural interactions across the Adriatic occurred since the Early Neolithic, involving different actors, modes and purposes through time. Between the 3rd and 2nd millennia BC the socio-economic organisation of the interacting communities transformed significantly and the nature and patterns of relationships appear to have transformed accordingly. By the Late Bronze Age multiple intersecting networks crossed the Adriatic, conveying goods and ideas and bringing into contact socio-economically differentiated societies.

However, our knowledge of these networks remains limited and available data for the various regions involved is unbalanced. For instance, while our knowledge of Aegean-Mycenaean connections in the Adriatic has highly improved in the last 20 years, trans-Adriatic networks still remain largely intangible. This is probably due to research bias, such as underexplored Bronze Age contexts in the Eastern Adriatic, but also to an inherent bias of the archaeological record, that is the low degree of visibility of goods, technologies and ideologies transmitted through the interconnections. Thus, how can we investigate the various dimensions (economic, social, ideological, technology transmission) of these contacts? Which data remains unexploited?

Through a reconsideration of existing evidence, we will discuss the potential of social archaeology for reconstructing patterns of cross-cultural interactions and their impact on socio-economic developments between the mid-3rd and the 2nd millennia BC.

04 MIGRATION IN THE CETINA PHENOMENON (?): AN AGENT-BASED PERSPECTIVE

Author(s): Gori, Maja - Schaff, Frederik (Ruhr University Bochum)

Presentation Format: Oral

Migration is a constant of human behaviour and both indicator for and a result of change. The spread of the Cetina phenomenon across the Adriatic at the end of the 3rd millennium BCE represents an outstanding case study to understand the relationship between people and objects on the move, and to assess the impact that migration has on cultural and societal changes.

In this paper we present an agent-based model (ABM) for the Cetina phenomenon. On the basis of the available archaeological record, we assume that small groups of people migrated from Dalmatia to Italy by means of seaborne connectivity. This can be inferred by the spread of typical Cetina elements to Italy. A small number of ceramics with Cetina features presumably locally produced by Dalmatian potters were recovered in funerary contexts and settlements. Since there is no similar indication in the material record of Dalmatia that can be used to trace migration from the Italian Peninsula to the Eastern Adriatic coast, we assume that migration was unidirectional.

The question that cannot be answered with (current) data is: "Why did people migrate from Dalmatia to Italy?". We provide a formalised theory based on current work by Kaminski et al. (2017) who combine social capital theory (P. Bourdieu 1986) with economic reasons to provide a theory of network formation in human societies. By extending the approach to a two-regions system, we provide a formal theory potentially capable to explain migration patterns related to the Cetina phenomenon.

Literature:

Kaminski, B., Growiec, K., & Growiec, J. (2017). A Dynamic Model of Social Capital and Economic Performance in Social Networks. In Social Simulation Conference 2017, Dublin.

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), Handbook of Theory and Research for the Sociology of Education (pp. 241-258). Westport, CT: Greenwood.

05 A GIS-BASED APPROACH TO MARITIME MOBILITY AND CONTROL ALONG THE IONIAN AND ADRIATIC COASTS IN THE BRONZE- AND IRON AGE

Author(s): Aslaksen, Ole Christian (University of Gothenburg)

Presentation Format: Oral

This paper seeks to explore the possibilities for interaction along the Adriatic and Ionian coastal areas by the means of identifying geographic bottlenecks at "maritime" routes and inland routes, where land and sea meets. In recent research a maritime dimension has been lifted by approaching the coastal hinterland 'as seen from the sea' (see Cooney 2003), the introduction of the concept of the maritorium (Needham 2009; Wehlin 2013), and GIS-applications (Leidwanger 2013).

The Ionian and Adriatic coasts are rugged, and an expert knowledge of maritime and inland geographies would be expected of the ancient traveler (see e.g. Oikonomidis 2007), who could be intercepted by those in possession of strategic locations, for example the northern tip of Corfu and Lefkada. In periods of interaction, control of geographic bottlenecks would thus be a major source of

power (see Rowlands and Ling 2013), as for example trade in metal (Sabatini 2016, 47) and amber (Palvestra 2007), but also the movement of technological knowledge and style, could be quenched at such locations. Within the field of pottery, phenomena that implies mobility includes the Cetina pottery of the Early Bronze Age (Maran 2007), the Mycenaean pottery of the Late Bronze Age (Buxeda I Garrigos et al. 2003; Wijngaarden 2002), as well as the matt-painted pottery of the Iron Age (Saxkjær and Jacobsen 2015; Krapf 2016).

A maritime GIS will be presented that may account for factors like waves, the slope of the coastline, and visibility, which would be of essence when it comes to control of the seaboard. A key question is how the geographies with the best possibilities for exercising maritime control were utilized throughout the Bronze- and Iron Age along the coast of the Ionian and Adriatic Sea.

06 NORTHERN ADRIATIC COMMUNITIES AND THEIR NEIGHBOURS THROUGH TIME: A DIACHRONIC PATTERN OF INTERACTION

Author(s): Borgna, Elisabetta (Dipartimento di Studi Umanistici e del Patrimonio Culturale) - Corazza, Susi (Dipartimento di Studi Umanistici e del Patrimonio Culturale) - Simeoni, Giulio (Dipartimento di Studi Umanistici e del Patrimonio Culturale)

Presentation Format: Oral

The contribution intends to put forward a diachronic pattern of interaction and maritime connectivity involving communities living in the regions of the so-called *Caput Adriae*, northern Adriatic.

Following a subdivision based on discrete indicators in the field of material culture as well as in the dynamics of continuity vs. discontinuity of population flows and settlement dynamics, some broad chronological phases will be delimited running from the late Copper Age up to the Final Bronze Age (Late Copper Age-Early Bronze Age 1, Early Bronze Age 2- early Middle Bronze Age, MBA-Recent Bronze Age 1, RBA 2-Final Bronze Age). Each phase will be object of a discursive presentation founded on a holistic approach to landscape, settlement distribution, funerary and ritual patterns, and circulation of bronzes, useful for both the outline of external contacts and the explanation of their nature.

For each phase a spatial analysis based on distribution maps of ceramics relevant to the theme of interregional relationships will be further provided. The comparative investigation of the analyzed frameworks will encourage the proposal of a diachronic explanatory pattern. Depending on the quality and quantity of available data, SNA will be tested with the aim of visualizing the position of certain communities in the negotiation of social and economic relationships at a regional level.

07 RETHINKING NETWORKS THROUGH THE KINSHIP DYNAMICS IN LATE PREHISTORIC SOUTHERN ILLYRIA

Author(s): Agolli, Esmeralda (Department of Archaeology and Culture Heritage)

Presentation Format: Oral

Cultural contacts, networks and so on, comprise a popular query in research of the Late Prehistoric southern Illyria and are addressed especially through pottery, metals or burial rituals and any other category of material culture. To a certain extent, so far this discussion has highlighted routes, spatial directions, distances and potential preference among various tribes in Illyria. Taking into account these dynamics, in this paper I attempt to synthesize what kind of parameters can establish networks patterns in groups that maintain kinship as their core social organization. In particular, I take into consideration how attributes of pottery, demography, mortuary rites, and settlement pattern could contribute to understand the models of these interactions in a diachronic order and how do social and economic premises motivate them. The paper concludes that the communities of Late Prehistoric southern Illyria maintain a network pattern ruled by the distance and only depended on movement and transmission of ideas rather than that of commodities. The kinship organization strictly based from the parameters of age and gender together with the slow demographic growth allows for these communities to succeed in preserving a self-subsistence style of living within boundaries defined by socio-cultural means which seem to rule the model of networks in southern Illyria.

08 DYNAMICS OF INTERACTIONS AND EXCHANGE IN THE SOUTHERN APULIA DURING THE IRON AGE

Author(s): Saponara, Antonella (Independent Researcher) - Semeraro, Grazia (University of Salento)

Presentation Format: Oral

The paper means to give a look at the trans-Adriatic and trans-Ionian interactions, analysing the documentation of Southern Apulia (Salento) between the end of 10th c. BC and the end of 8th c. BC. It will provide an update of data related to the distribution of imported pottery – coming mostly from Greece but also from the Illyrian area - examining closely the role of it inside the Southern Apulia settlements. New research about the Iron Age Iapigian contexts has been conducted in recent years; they have allowed us to deepen our knowledge on dynamics of settlement development of local communities during the Iron Age and on the relationships among them. In this paper, it will be also analysed interactions and exchanges with the foreign communities and how the Southern Apulian settlements have been involved in these phenomena. Interactions and exchange, in this case, mean transmission of culture, ideas, symbols, arts, techniques, not as unilateral way but the construction of a wide cultural basin where every community expresses own local identity. The contribution will also refer to the application of approaches assumed from the network analysis, allowing to endorse research hypotheses or to have a different look at phenomena already widely debated.

09 EXCHANGING IDEAS: THE SOCIAL IMPLICATIONS OF NETWORKS OF INTERACTION IN THE ADRIATIC AND IONIAN REGIONS

Author(s): Rom, Iris (University of Groningen)

Presentation Format: Oral

When discussing networks of interaction, material goods, such as pottery and metal, often take center stage. Indeed, the origins of these objects can give a direct clues to which areas stood in contact with each other. In addition, their quantifiable numbers may reveal the intensity of these contacts and their developments over time.

More problematic, however, is understanding the use of networks for the exchange of ideas. When a 'new' or 'exotic' object is introduced, its social meaning is not easily derived. Does the object only represent the (direct or indirect) exchange of goods between social groups, or also the exchange of the associated social practices and ideas? Or, does it represent the actual migration of people? Although addressing these issues is notoriously difficult, it is important to do so when discussing networks of interaction. Only then can we come closer to understanding how the networks of interaction actually impacted its participants.

To approach the intended meaning of an object, the use of contextual analysis is of key importance. An object's context can be used to reconstruct the social practices in which it was used and subsequently, some of the social relationships underlying these practices may be inferred. Burial contexts are particularly useful to investigate these relationships as the creation (and modification) of the mortuary context is almost invariably the result of intentional actions. The living society actively created the mortuary context to represent a complex mix of traditions, beliefs, social distinctions, relations, and emotion, which were deemed important.

In this paper I will explore the use of several recurring burial elements within West-Greek and Adriatic regions during the Early and Middle Helladic periods. West-Greece has only been limitedly been discussed in relation to a western network, and its social impact subsequently may have easily been undervalued.

527 WATER MENTALITIES. ARCHAEOLOGICAL CLUES TO CHANGES IN WATER MANAGEMENT DURING THE MIDDLE AGES

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Meier, Thomas (University of Heidelberg, Heidelberg Center for the Environment; University of Heidelberg, Institute for Pre- and Protohistory and Near Eastern Archaeology) - Retamero Serralvo, Fèlix (Universitat Autònoma de Barcelona, Departament de Ciències de l'Antiguitat i l'Edat Mitjana; Universitat Autònoma de Barcelona, SGR Arqueologia agrària de l'Edat Mitjana - ARAEM)

Format: Regular session

The last decade saw a lot of archaeological research in general issues of medieval water management like flood protection, irrigation, drainage, mill canals etc. - i.e. anything which aims at a more or less complex management of too much or too little water. Most of this research is focused on the technical perspective of water management while the mental aspect is widely neglected. The invention and application of techniques, however, is not only a question of technical abilities, but of mental conditions: An event has to be considered a problem and the solution of the problem must be regarded to be in the reach of society. Regarding water during the middle ages we may ask, who considered too much or too little water a problem (e.g. peasants, landlords, clergy etc)? When was it a problem or when was it just a natural event like snow or a storm? Technical measures - if they occurred - definitely show that flooding or drought was considered a problem and the areas which were improved may indicate the actors and their values. When and by whom were natural events simply regarded as divine will or examination or punishment which has to be accepted? And when does who dare to use technical measures to manage these problems, i.e. to subjugate nature to human control - against or in accordance with divine will?

In this session we invite papers from all over Europe to explore such changes of medieval mentalities by analysing water management systems.

ABSTRACTS

01 WATER MENTALITIES - AN INTRODUCTION

Author(s): Meier, Thomas (University of Heidelberg, Institute for Pre- and Protohistory and Near Eastern Archaeology; Heidelberg Center for the Environment)

Presentation Format: Oral

The archaeology of medieval water management has greatly increased during the last years. The rising awareness of today's societies that water is either too much or too little but hardly available at the right amount, has directed the interests of archaeologists towards historical measures of flood protection, irrigation, drainage, mill canals, and urban water supply and sanity. However, most research is driven by technical interest while social issues fall short of notice and mental dimensions are neglected at all. But water management needs the interaction of all three fields: Technical ability is as much required as social acceptance of management facilities, while both are based in mental conditions: An event has to be considered a problem and the solution of the problem must be regarded to be in the reach of society. Technical measures - if they occurred - definitely show that floodings, droughts or

water sanity were considered as problems. But who considered too much or too little water a problem or merely a natural event (e.g. peasants, landlords, clergy etc)? Were natural events or illness simply regarded as divine will or examination or punishment? And when does who dare to use technical measures to manage these problems, i.e. to subjugate nature to human control – against or in accordance with divine will?

02 LONG-TERM WATER MANAGEMENT IN THE MIDDEN-DELFLAND REGION, WESTERN NETHERLANDS

Author(s): Flamman, Jeroen (Vestigia Archeologie & Cultuurhistorie)

Presentation Format: Oral

Can you overlook the effect of your intervention in the landscape for the future? Or that your activities are the consequence of water management centuries before? And is it your resourcefulness or is it being ordered? Large scale archaeological research in the Midden-Delfland area raised the opportunity to study long-term water management and the influence and founding of local and regional government.

Since the Iron Age the inhabitants were protecting themselves against the influence of the water. It was focussed on the high water level in the streams and on water from the peat area. Living on naturally drained peat islands resulted in the irreversible draught of the soil so people had to move to dryer living grounds.

During the Roman period people were more capable in dealing with water. Near to the main water courses small dikes were built in waterways to prevent daily tidal influence. More inland the landscape was developed by using the former river channel to drain the wet areas. Many ditches were dug in a system planned by the Roman government.

After a period of less habitation from the 10th century on less useful areas were cultivated, drained and made valuable for agriculture ordered by the Counts of Holland. After several floodings and dike breakthroughs stronger dikes and also inland dikes were created. This needed also the management of the transport of abundant water by small rivers and canals. Besides cooperation in the field also at administrative level one had to work together. In the 13th century the count ordered several water management constructions like tidal locks and larger canals. In 1289 he established the Delfland Water Authority. Since then this authority takes care for the maintenance of dikes and dams and the regulation of the water level in streams, lakes, ditches, moats and canals.

03 WATER SUPPLY AND SEWAGE NETWORK IN SIXTEENTH CENTURY LISBON: DRAWING THE RENAISSANCE CITY

Author(s): Teixeira, Andre - Banha da Silva, Rodrigo (FCSH/NOVA)

Presentation Format: Oral

Sixteenth century Lisbon was perceived by foreigners as filthy and fetid. Even if they admired the global city, where products and ideas arrived from all over the world, they described muddy streets, garbage dumps everywhere and unclean people. Nevertheless, since the end of the 15th century, Portuguese kings started implementing a sewage network and the cleaning of the city. This was simultaneous with an urban regulation process and the aim to give monumentality to the city. Authorities also created a plan to enable access to clean water, opening wells and building public fountains, not only for its inhabitants but also to supply the needs of Lisbon's dynamic waterfront, where maritime and commercial activities were concentrated. Furthermore, even if the ancient Roman and the medieval Islamic habit of using public baths was lost, some of the groundwater of Lisbon's old medina was still being utilized, with some noblemen providing their new-built palaces with baths. Thus, during the 16th century, water and its control was not only a matter of necessity, but also a sign of modernity.

The last few years of rescue archaeology provided huge information concerning Lisbon's water systems before the 1755 earthquake, most of them built in the 16th century. These data is being crossed with part of its architectonic remains, but especially with archival documentary sources. This interdisciplinary approach is leading us to a much more accurate knowledge on the importance of water in these early modern societies.

04 PRE-INDUSTRIAL WATER MANAGEMENT IN FLEMISH METROPOLI: DRAWING FROM ARCHAEOLOGICAL WATER FACILITIES

Author(s): van Oosten, Roos (Leiden University)

Presentation Format: Oral

A decisive factor in the health and wellbeing of residents of pre-industrial towns was access to clean water. While drawing water from canals was probably customary in water-rich and small towns, this proved to be problematic in areas of rapid urbanisation where increased pollution in canals probably took place in tandem with increased population. This is the case in late-medieval metropoli in Flanders, such as Bruges with 45,000 residents and Ghent with 64,000, where drawing potable water from canals was not a matter of course. Although Bruges and Ghent show a similar demographic-economic trend (after booming economies in the 14th century, both towns had dwindled in population by the 17th century), their sanitary water infrastructures were vastly different. Bruges is known for having installed sophisticated water pipes already in the Ancien Régime, while Ghent's pre-industrial water management has been described as 'a chapter of disillusionment' (Devriese, 'Van Gentse openbare waterputten en watertrappen' De Heraut, 2011, 20). Unfortunately, documentary evidence regarding water facilities prior to 1800 is relatively vague. However, in recent decades, urban archaeologists have uncovered hundreds of sanitary infrastructure elements related to public health (wells, cisterns,

water pipes, etc.). In my presentation, I will present the preliminary results from an inventory of recovered archaeological water facilities in order to address the question of whether the archaeological evidence underpins the stark difference between Bruges and Ghent supposed by historians.

a. THE RELEVANCE OF THE REC COMTAL IN BARCELONA: ANALYSIS OF THE SECTION PRESERVED IN THE ARCHEOLOGICAL SITE OF EL BORN CCM

Author(s): (El Born CCM - collaborating archaeologist) - Miró Alaix, Carme (Servei d'Arqueologia de Barcelona. Institut de Cultura de Barcelona. Ajuntament de Barcelona)

Presentation Format: Poster

This presentation aims to analyze Rec Comtal, one of the most important pieces of hydraulic infrastructure in Barcelona in the medieval and post-medieval periods, as it passes through the section preserved in the archeological site of El Born. Either from an urban perspective or from a more social look approach, this paper will present what functions the Rec Comtal had and how did the residents of the Ribera district of Barcelona use it.

Rec Comtal was an artificial water channel designed to bring water to the city in order to irrigate fields, churn gristmills, and collect wastewater from streets and residences along its route. It was not intended to be a source of water for human consumption, since the inhabitants of the city extracted drinking water from residential wells.

The archaeological dig in Born includes a section of the waterway that dates from the 14th century (when the neighborhood was urbanized) to 1717, when the canal was lost beneath the rubble of homes demolished for the construction of a military fortress. The section preserved in the Born Center of Culture and Memory (Born CCM) was located on what was then the outskirts of the city, actually, the Rec also became an open sewer where residents discarded garbage, ceramics, and bones.

The archeological project at Rec Comtal has uncovered many artifacts that help us understand the material culture of the inhabitants of the area. One of the important features of the stratigraphy of the Rec in Born is a layer that dates from the end of the 14th century and the beginning of the 15th century, which is covered directly by additional layers from the 17th and 18th centuries; this indicates that throughout its existence, the areas have been periodically maintained, a process that involved the cleaning and extraction of sediments.

b. ARCHAEOLOGICAL SURVEY ON A WATERMILL IN IBIZA (BALEARIC ISLANDS, SPAIN)

Author(s): Graziani, Glenda - Ferrer, Antoni - Kirchner, Helena (Universitat Autònoma de Barcelona)

Presentation Format: Poster

The knowledge on islamic watermills in Balearic Islands is due to M. Barceló and his research group at the Universitat Autònoma de Barcelona. The first condition they established is that mills have to be seen as a part of a whole hydraulic system. Most of this systems were analyzed on the three main Balearic islands and, then, in Valencia too. This survey on the watermills allowed to observe trends on the situation of the milling engines in the net of dams, channels, orchards and other elements belonging the hydraulic systems: generally islamic watermills were built at the end of the main channel. This poster presents the results in the excavation of the remains of a watermill — called Es Molinot — standing at the end of a hydraulic system called Torrent de ses Fonts, on Sant Josep de sa Talaia, Ibiza island. The situation of the watermill would indicate an islamic chronology, on the contrary, other evidences, as the fact that the water came from an independent own channel, might be the sign of a more recent date of construction. The main objective is to establish a chronology through archaeological materials. Being islamic, Es Molinot would be on the same trend than the other studied watermills, but if it is dated on a later time it might be a proof of the transmission of one technical solution by personal interchange of knowledge, or by imitation. In the case of a post-Islamic chronology the constructive characteristics of this mill could be used to date two other very similar mills located in different places of the island

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NEW AND INTERDISCIPLINARY APPROACHES IN RESEARCH INTO THE HUNTER-FISHER-GATHERER STONE AGE ON THE EASTERN SHORES OF THE BALTIC

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Luebke, Harald (Centre for Baltic and Scandinavian Archaeology - ZBSA Schleswig) - Berzins, Valdis (Institute of Latvian History, University of Riga) - Koivisto, Satu (Archaeological Field Service, National Board of Antiquities; Department of Archaeology, University of Helsinki)

Format: Regular session

The landscapes of the Baltic Sea's eastern shores, shaped by glacial and marine processes, present flat and hilly terrain, with many lakes, extensive wetlands and a long coastline with extensive gulfs. These landscape features offered the hunter-fisher-gatherer populations of the Stone Age rich concentrations of subsistence resources – although it was a dynamic landscape, with changes brought about by land uplift and associated shifts in the state of the Baltic Sea basin, and with a climatically shifting boundary between temperate and boreal forest zones. Habitation and burial sites in the region, including several with outstanding preservation conditions, have given a rich picture of past lifeways,

encompassing subsistence and everyday activities, as well as rituals and beliefs.

Recent research, with the application of innovative and interdisciplinary approaches, is providing deeper insights into the region's Stone Age archaeological record, and is helping to situate it within a wider context, in relation to neighbouring regions, namely the plains of Eastern and Central Europe, and the Scandinavian Peninsula.

This session aims to examine a spectrum of topics with respect to this region and relationships to neighbouring areas:

- the contribution of novel and/or interdisciplinary approaches for improving our understanding of hunter-fisher-gatherer lifeways;
- obtaining a more complete picture of how past populations adapted to this dynamic landscape (site locations, procurement strategies and seasonality, mobility, resource base, technological development, social complexity, funerary practices);
- future prospects: how to proceed within this field and what methodologies and cooperation (inter/intradisciplinary) ought to be established and developed further.

ABSTRACTS

01 SESSION 531 - INTRODUCTION TALK

Author(s): Luebke, Harald (Centre for Baltic and Scandinavian Archaeology) - Berzins, Valdis (Institute of Latvian History, University of Latvia) - Koivisto, Satu M. (Archaeological Field Services, National Board of Antiquities)

Presentation Format: Oral

The landscapes of the Baltic Sea's eastern shores, shaped by glacial and marine processes, present flat and hilly terrain, with many lakes, extensive wetlands and a long coastline with extensive gulfs. These landscape features offered the hunter-fisher-gatherer populations of the Stone Age rich concentrations of subsistence resources – although it was a dynamic landscape, with changes brought about by land uplift and associated shifts in the state of the Baltic Sea basin, and with a climatically shifting boundary between temperate and boreal forest zones. Habitation and burial sites in the region, including several with outstanding preservation conditions, have given a rich picture of past lifeways, encompassing subsistence and everyday activities, as well as rituals and beliefs.

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- future prospects: how to proceed within this field and what methodologies and cooperation (inter/intradisciplinary) ought to be established and developed further.

02 LATE GLACIAL AND EARLY HOLOCENE SETTLEMENTS IN THE EASTERN BALTIC COASTAL AREA. WHERE TO FIND THEM?

Author(s): Rimkus, Tomas - Girininkas, Algirdas - Žulkus, Vladas - Daugnora, Linas (Institute of Baltic region history and archaeology, Klaipėda University)

Presentation Format: Oral

More than half hundred of Neolithic settlements dating back to the sub-boreal period have been found and explored in the coastal area of Lithuania. Many of them were established at the shores of the former lagoon origin lakes. However, only some individual finds indicates the period before the sub-boreal. Currently, only one Late Palaeolithic settlement has been found in the Lithuanian coastal zone, several more are dated to the Boreal – Atlantic periods. Comparing the littoral and continental parts of Lithuania, a clear difference between the abundance of Late Paleolithic and Mesolithic settlements can be noticed. The natural question arise, why there are no early periods dated settlements and where to look for them? In 2002 the first sunken tree trunks, which turned out it was pine, remains were discovered in the bed of Lithuanian Baltic Sea waters, while in the course of their investigations they were also found in other places of Lithuania's territorial waters. In 2016 the first traces of human activity were discovered during the research. The remnants of the pines, dating from Yoldia to the Ancylus period, indicates the former dryland, which was flooded by the Litorina transgression. It turns out that humans responded to the quickly changing landscape and left their settlements which were flooded by the rising sea level. In 2017 Klaipėda University launched a project for underwater and coastal area archaeological research, which will seek to find and explore the earliest Stone Age settlements. Here we present current data and the newest results of this area's archaeological surveys.

03 QUANTIFYING THE SHORELINE CONNECTION OF THE STONE AGE SETTLEMENTS IN SOUTHERN KARELIA (FINLAND)

Author(s): Sikk, Kaarel (University of Luxembourg) - Kriiska, Aivar (University of Tartu) - Nordqvist, Kerkko (University of Oulu) - Rostedt, Tapani (Independent researcher) - Caruso, Geoffrey (University of Luxembourg)

Presentation Format: Oral

The connection between settlement sites and water bodies has been the most prominent characteristic of the Stone Age settlement patterns in North-Eastern Europe. Geologist and archaeologist Constantin Grewingk stated already in 1865 that in the Eastern Baltic region "Stone Age people lived by the sea and rivers". Although there was no empirical data at that time, the following discoveries confirmed this claim. The connection is so obvious that archaeological sites are effectively used as a proxy data for reconstructing past shorelines that have been changing due to isostatic land uplift and changing hydrological conditions.

The goal of current paper is to give a statistical description of the settlements' position relative to the shoreline. The case study is based on the Stone Age settlement site locations in Southern Karelia, Finland. The region is characterized by several water bodies, including lake Saimaa, as well as several smaller lakes and rivers. A small amount of settlements in the south-eastern part of the study area is also located on the paleoshorelines of the Baltic Sea.

The following questions are asked: how many and what kind of Stone Age sites are shoreline-connected? How to statistically describe the distribution of distances from the settlements to the closest shoreline? Because of the abundance of lake shores in the region, it also has to be judged if the settlement pattern was formed by the economical/cultural lifeways of past inhabitants or was it just enforced by the landscape. To answer this question, it is analysed if the distribution of distances to shoreline of Stone Age sites significantly differs from the ones of later periods?

04 SEARCHING FOR INUNDATED HUNTER-FISHER-GATHERER SITES IN LAKE ENVIRONMENTS IN SOUTH-EASTERN FINLAND

Author(s): Koivisto, Satu (University of Helsinki)

Presentation Format: Oral

The Saimaa Lake complex in the eastern part of Finland has constituted one of the major inland water systems transmitting technical and cultural influences between vast regions throughout millennia. After isolation from the Yoldia Sea ca. 11 000 years ago, the water level of the small Early Mesolithic lakes was relatively low. Due to the post-glacial land uplift and lake tilting, the Saimaa basin continued to transgress towards the southeast direction and thus inundated the earlier lakeshores. By 6000 BP, the ancient Lake Saimaa reached its maximum extent, nearly 9000 km² in size, which culminated in the outburst of the Vuoksi River in the south ca. 4000-3700 calBCE. Because of the transgression, the Mesolithic and Early Neolithic sites are to be found under water and in wetlands surrounding the present-day Saimaa Lake. A project entitled 'Lost Inland Landscapes' by the University of Helsinki aims in finding the paludified and submerged Stone Age sites in the lower Lake Saimaa area. On Finnish drylands, practically all the organic materials from the Mesolithic and Early Neolithic have deteriorated, but in wet environments, fairly much of them might have survived. If successful, the project would yield scientifically highly important new data on the Mesolithic and Early Neolithic periods in SE Finland. The presentation will outline the main activities of the project and its recent achievements and review the available methods for detecting deeply buried archaeological remains in demanding underwater and wetland conditions in lake environments.

05 INTERDISCIPLINARY RESEARCHES OF THE NEOLITHIC PEAT SITES IN THE SOUTHERN SHORE OF LAKE LADOGA (EASTERN BALTIC)

Author(s): Gusentsova, Tatiana (Autonomous Non-commercial Organization)

Presentation Format: Oral

The interdisciplinary researches (archaeological, geological, modelling, geochemical, pollen, diatom and paleozoological) of cultural horizons from the archaeological sites Podolje 1,3 allowed to reconstruct an ancient landscape and an environment in the Southern part of Lake Ladoga during the people occupation in the Stone Age as well as their economic, fishing and hunting strategies. The archaeological and geological, geochemical studies have shown that the archaeological sites were disposed on the shore of paleobasin (lake lagoon) or the river bank. On the base of these data the 3D geological model of an ancient relief with basin and paleochannels located to the East from modern shore zone of Ladoga was designed. Pollen and geochemical data indicate the most prominent human impact signal in the peaty sediments in Podolje sites. The cultural layers consist of the sand deposits with interlayer of black organic rich deposits and peat layer. Concentrations of fishing constructions, bones and ceramic vessels, amber pendants, isolated tools and flakes made of flint and quartz, an adze of russian-karelian type were found in the peat layer. The Podolje 1,3 sites were occupied from the 4500 to 2600 cal BC according to radiocarbon dating. The ceramic and stone assemblages, amber pendants have analogies to the Neolithic and the Early Metal sites of Prionezhie, Baltic States, Volga-Oka river basin.

06 DECIPHERING RIŅŅUKALNS: NEW EVIDENCE FROM A COMPREHENSIVE INVESTIGATION OF LATVIA'S FRESHWATER SHELL MIDDEN

Author(s): Berzins, Valdis (Centre for Baltic and Scandinavian Archaeology - ZBSA; Institute of Latvian History, University of Latvia) - Lübke, Harald (Centre for Baltic and Scandinavian Archaeology - ZBSA) - Meadows, John (Centre for Baltic and Scandinavian Archaeol-

ogy - ZBSA; Leibniz Laboratory for Radiometric Dating and Stable Isotope Research, Christian-Albrechts-Universität zu Kiel) - Schmölke, Ulrich (Centre for Baltic and Scandinavian Archaeology - ZBSA) - Zagorska, Ilga (Institute of Latvian History, University of Latvia) - Brinker, Ute (Centre for Baltic and Scandinavian Archaeology - ZBSA) - Ceriņa, Aija (Faculty of Geography and Earth Sciences, University of Latvia) - Kalniņš, Mārcis (Centre for Baltic and Scandinavian Archaeology - ZBSA; Faculty of History and Philosophy, University of Latvia) - Ritchie, Kenneth (Centre for Baltic and Scandinavian Archaeology - ZBSA) - Rudzīte, Mudīte (Museum of the History of Science and Technology, University of Latvia)

Presentation Format: Oral

Field research at the unique Riņņukalns freshwater shell midden in Latvia resumed after a long hiatus in 2010–2011, providing a new view of this special Stone Age site and demonstrating that it still holds great research potential.

Now, within the frame of a three-year interdisciplinary project funded by the German Research Council (DFG), Riņņukalns is being comprehensively studied by the Centre for Baltic and Scandinavian Archaeology (Germany) together with the University of Latvia. After a first excavation season in 2017, work will continue in summer 2018, followed by a wide-ranging assessment of all the new and previous material from this site.

An excavation trench placed across the midden, with detailed photogrammetric recording, has allowed the individual midden layers to be traced more extensively. Contrary to expectation, the distinct layers of shell and fish bone in this part of the site, deposited within a brief period c. 3350 calBC, do not represent small dumps of material but have a horizontal extent of some metres, prompting reconsideration of the mode of formation. Within the area already excavated in the 1870s the midden itself had largely been removed, whereas the organic-rich deposit underneath survives largely undisturbed, and excavation of this deposit is illuminating the site's earlier history of occupation.

The evidence for ochre processing reveals a previously unexplored dimension of the site. The highlight, however, has been the discovery of an undisturbed grave immediately underlying the lowermost midden layers – one of just three intact Stone Age burials so far unearthed on the site.

The large-scale flotation and wet sieving programme has yielded an extensive corpus of fish and mammal remains, mollusc shell and plant macrofossils, contributing a wealth of new information to the current picture of Stone Age subsistence in the region.

07 NEOLITHIC MOBILE ART OF EASTERN BALTIC: THE VIEW FROM THE EAST

Author(s): Kashina, Ekaterina (State Historical Museum, Moscow)

Presentation Format: Oral

The main objective of this presentation is to compare the Neolithic mobile art in the Eastern Baltic with the assemblage of art pieces from neighboring territories: Russian Federation, Republic of Belarus, and Scandinavia. In the Final Stone Age the vast territory of Russian Plain forest zone was a single whole featuring multiple relationships and common cultural and spiritual phenomena of its communities. Nevertheless, the mobile art traditions were not common everywhere, showing regional and temporal features. Eastern Baltic territory undoubtedly possessed its local traits in carved sculpture (4000-3000 BC), showing the abundance of human and snake images. Latvian anthropomorphic clay sculpture (around 3000 BC) considerably differed from the rest of Circumbaltic human figurines. On the other hand, the elk-head antler staffs, wooden ladles with bird heads, Comb-Pitted Ware figurines and bird images on vessels were highly similar to those in other regions. The striking resemblance between the collections of mobile art at Tamula (Estonia) and Sakhtysh sites (Central Russia), which are situated around 800 km apart, could point at the direct connections of particular communities involved in the amber exchange route. All sculpted pendants are recognized as the ancestor (human image) or totem-animal representations. Among them snakes and waterfowl were seemingly the most common at the territory of Eastern Baltic countries, while at the central part of Russian Plain birds of forests and bogs were prevalent among pendant images. The plain landscape, rivers and modest distances made easier both the population movements and the spread of ideas along the boreal zone of North-East Europe.

08 NEW, INTERDISCIPLINARY STUDY OF ANIMAL BONE BEADS FROM ZVEJNIEKI CEMETERY (LATVIA) AND SAKHTYSH II CEMETERY (CENTRAL RUSSIA)

Author(s): Macane, Aija (University of Gothenburg)

Presentation Format: Oral

Animal remains, particularly animal teeth (mainly incisors and canines) have been extensively used for personal adornments at hunter-gatherer cemeteries around the Baltic Sea. However, other body parts, like jaws, phalanx, astragalus, antlers, claws and beads made of animal bones have also been found within hunter-gatherer burials. This presentation focuses on new, interdisciplinary research of animal bone beads discovered in hunter-gatherer burials at Zvejnieki cemetery (northern Latvia) and Sakhtysh II cemetery (central Russia). Previously these beads have been interpreted as originating from bird bones, but the current investigation reveals new information about these beads and offer possibilities for re-evaluation of this type of adornments within hunter-gatherer burials.

This study is part of the dissertation project that problematize the Holocene hunter-gatherer relationship with the animal world and surrounding environment, how animal and human worlds co-existed, confronted, affected and used one another during the Stone Age. Other materials included in this research come from Skateholm cemetery in southern Sweden and Sakhtysh cemeteries in the

Upper Volga region of central Russia. The theoretical framework of this project is anchored in the growing field of environmental humanities and related theoretical approaches including posthumanism, new animism and new totemism, which all in different ways aim to decentralize human dominance and assign more active roles to other participants of the multi-layered relations between humans and animals.

09 ENIGMATIC T-SHAPED ANTLER AXES OF THE NORTH-EAST EUROPEAN FOREST ZONE – AN UPDATE

Author(s): Luebke, Harald (Centre for Baltic and Scandinavian Archaeology) - Vashanau, Aliaksandr (Institute of History, National Academy of Sciences of Belarus) - Rimkus, Tomas (Institute of Baltic Region History and Archaeology, Klaipėda University) - Berzins, Valdis (Institute of Latvian History, University of Latvia) - Butrimas, Adomas (Vilnius Academy of Arts, Institute of Art Research) - Charniauski, Maxim (Institute of History, National Academy of Sciences of Belarus) - Meadows, John (Centre for Baltic and Scandinavian Archaeology; Leibniz Laboratory for Radiometric Dating and Stable Isotope Research, University of Kiel) - Piezonka, Henny (Institute of Prehistory, University of Kiel)

Presentation Format: Oral

A T-shaped antler axe is an immediately recognisable tool type, consisting of a relatively straight section of a red-deer antler beam, sharpened at one or both ends, with a perpendicular shaft-hole drilled through the middle and emerging at the base of a truncated tine. T-shaped axes are familiar from Late Ertebølle assemblages in the South-western and Southern Baltic, where they appear from the second quarter to the end of the 5th millennium cal. BC. In the Eastern Baltic area such an antler tool industry was nearly unknown and for some time it was thought that the few finds have been derived from the west or southwest. However, T-shaped antler axes have a much wider distribution to the southern east and west of Europe, where they occur in the Danube Gorge already at the beginning of the 6th millennium. In some cases they are found in mortuary contexts, but at the northern and eastern limits of their distribution, they are only known from alluvial deposits, and are therefore not easily datable.

Two recent finds from western Latvia were dated by AMS in 2014, one giving the expected late 5th millennium date, but the other dating a thousand years earlier and questioned the previous theories of origin. Today, more than 20 T-shaped axes from Belarus, 8 from Lithuania and 3 from Latvia marking the eastern edge of the known distribution of this artefact type. Most of these finds are from alluvial deposits, although the concentrations of finds, and the identification of production waste in two regions, provide the first indications of their archaeological context. After a first report on the EAA2017 we will report the updated results of a programme of direct AMS dating of these artefacts, and comment on their implications.

10 LONG-TERM VARIATION IN COMMUNICATION AND SOCIAL RELATIONS DURING THE STONE AGE OF EASTERN BALTIC (10500–6500 BC) – A TECHNOLOGICAL APPROACH

Author(s): Damlien, Hege - Berg-Hansen, Inger Marie (Museum of Cultural History University of Oslo) - Kalniņš, Mārcis (Faculty of History and Philosophy, University of Latvia) - Zagorska, Ilga (Institute of Latvian History, University of Latvia) - Schülke, Almut (Museum of Cultural History University of Oslo) - Bērziņš, Valdis (Institute of Latvian History, University of Latvia)

Presentation Format: Oral

The Stone Age of the Eastern Baltic is characterized by several shifts in lithic tool technology. The question of how these changes relates within a wider North European context have, so far, been less thoroughly addressed. Traditionally, research efforts have primarily focused on typological aspects of formal tool types. In this paper we focus on how lithic technology can be used as proxy for investigating variation in social interaction and communication in the past. In the last decades, technological analyses within the chaîne opératoire approach have received increased attention, and its relevance for describing cultural relationships has been demonstrated. Until now, there have, however, been few detailed technological studies of lithic collections from the Eastern Baltic region, and our knowledge of the technological development in the area is inadequate. Based on technological analysis of lithic assemblages from Final Palaeolithic and Mesolithic sites in the territory of present-day Latvia conducted within the TechTrans project, we focus on two chronological contexts demonstrating variation in knowledge transmission and lines of communication across large geographical areas. Our studies reveal the Eastern Baltic as an important region for understanding cultural change during the Mesolithic of Northern Europe, and provide new insights into the Final Palaeolithic societies.

11 EVALUATING THE ORIGINS, MOTIVATIONS AND IMPLICATIONS OF EARLY POTTERY USE BY HUNTER-GATHERERS OF THE EASTERN BALTIC

Author(s): Craig, Oliver (University of York)

Presentation Format: Oral

The arrival of pottery marks a clear archaeological horizon in the Eastern Baltic sequence, often synonymous with the period known as the Neolithic, despite predating agriculture by several thousand years. However, the motivations for the introduction of pottery at this juncture in Baltic prehistory or the advantages it may have conferred on fisher-hunter-gatherers of the region remain unclear. It has been proposed that pottery containers were part of a pre-farming package of technological innovations that led to more intensive food procurement, increased sedentism, higher population densities and the development of exchange networks; a technology that transformed social organisation and territorial control and one that was as important as farming for guiding Europe's subsequent cultural trajectory. But is this really true? Or did ceramic technology merely represent a small step in the evolution of containers; from soft perishable to hard durable forms? Focusing on the Eastern Baltic, I will evaluate new lines of recently published

biomolecular evidence that are starting to address this question. Stable isotopes of human remains allows us to understand how diets might have changed with the advent of pottery to understand its impact. Through ancient DNA we can examine whether the introduction of pottery is associated with demographic change, perhaps incomers who brought knowledge of the technology from elsewhere. And through biochemical analysis of pottery residues, we can directly assess the use of earliest vessels in this region. Finally, and maybe most crucially, is the issue of accurate dating is needed to bring these different lines of evidence into a coherent sequence.

12 AN «USKELA-LIKE» GROUP OF THE LATE COMB WARE FROM KARELIAN ISTHMUS, NORTH-WEST RUSSIA

Author(s): Kholkina, Margarita (A.P. Karpinsky Russian Geological Research Institute - VSEGEI)

Presentation Format: Oral

A. Europaeus-Åyräpää in 1930 described vessels of the Uskela Ware from Karelian Isthmus, mentioning their differences from the Western Finland pottery. Later the Uskela Ware was described as a purely coastal phenomenon in Finland.

A group of the Late Neolithic pottery that resembles the Uskela Ware was defined in Karelian Isthmus. This group differs from the “classic Uskela” in elements proportion (high percentage of comb imprints) and in the rim shape (thickened and decorated). But there are also many treats of the “Uskela-like” pottery from Karelian Isthmus that are similar to the “classic Uskela”: specific porous structure, glossy surface, unprofiled walls, a lot of empty undecorated space and the dominance of pits in decoration. The described group of pottery from Karelian Isthmus can be considered as a local or “periphery” variant of the Uskela Ware.

In the eastern part of the Gulf of Finland region this Uskela-like pottery is one of the earliest groups of porous ceramics, which coexisted with the Typical Comb Ware and has many similarities with it as well as with the Eastern Swedish Pitted Ware.

Rather small areal of Uskela-like ceramics in Karelian Isthmus and a short period of being in use probably mean that it was a local episode of spreading the tradition to the east, while its main area was on the territory of modern Finland. Finally, such pottery on the Karelian Isthmus can probably serve as one of a few evidences of the influence on this area from the territories situated far to the west.

This work has been supported by the Russian Science Foundation grant №17-77-20041 (project «The impact of global, regional and subregional natural factors on the development of coastal morphosystems of the eastern Gulf of Finland as a human living environment»).

13 TRACING THE CHANGES OF HUNTER-GATHERER POTTERY IN WESTERN LITHUANIA, 4400-2700 CAL BC

Author(s): Gaižauskas, Lukas (Nature Research Centre, Vilnius)

Presentation Format: Oral

As the investigations into the past of hunter-gatherer-fisher and later Neolithic communities to the East of the Baltic Sea are on the rise and gaining more depth in terms of interdisciplinary approaches, the chronological definition of pottery produced by these communities is still somewhat underdeveloped in large parts of the region, namely, W Lithuania. The variability of hunter-gatherer pottery both hinders comparison, but also offers approaches for building frames of periodisation, which in turn are very useful when dating the archaeological assemblages to which various methods of research are applied. The issue of pottery definition becomes very important when extrapolating research results related to various cultural, demographic or subsistence changes in the Stone Age communities.

To create a more definite periodisation of hunter-gatherer (sub-Neolithic) pottery in W Lithuania, morphological, stylistic and technological variation across different strata at the recently excavated, stratified wetland site Daktariškė 5 near lake Biržulis was analysed and compared with the pottery from several type-sites located in Šventoji. Typological and stratigraphic analysis allowed the identification of morphological pottery traits, on basis of which three distinct and chronologically separate types were defined. These types are represented in different stratigraphic contexts and on short-term sites from c. 4400 to 2700 cal BC, both in coastal Lithuania (Šventoji) and inland (lake Biržulis). Also, present are some results of petrographic analysis made on thin-sections of both hunter-gatherer and Neolithic pottery from W Lithuania, which offer deeper insight into pottery technology and change at the onset of the Neolithic.

14 POTTERY USE IN THE SOUTHEASTERN BALTIC FROM THE SUBNEOLITHIC TO THE BRONZE AGE

Author(s): Robson, Harry (University of York) - Skipitytė, Raminta (Center for Physical Sciences and Technology) - Piličiauskienė, Giedrė (Faculty of History, Vilnius University) - Lucquin, Alexandre - Craig, Oliver (University of York) - Heron, Carl (British Museum) - Piličiauskas, Gytis (Lithuanian Institute of History)

Presentation Format: Oral

With the arrival of the Globular Amphora and Corded Ware cultures into the Southeastern Baltic, ca. 2900-2300 cal BC, a new type of economy, animal husbandry, was introduced. However, it has been previously demonstrated that domesticates were not initially integrated, and that a predominantly hunter-gatherer-fisher economy persisted. For example, pottery was primarily used for processing aquatic organisms supplemented by ruminant adipose and dairy fat at the coastal sites of Nida and Šventoji, Lithuania (Heron et al. 2015).

Building on the previous study, here, we report the organic residue analysis undertaken on 64 vessels supplemented by bulk stable isotope data (36/64 vessels) from Subneolithic, Neolithic and Early Bronze Age (ca. 3200-1300 cal BC) sites in Lithuania. Mixtures of different foodstuffs, including ruminant adipose and aquatic products, were identified in the pots sampled from the Subneolithic and Neolithic sites. In contrast, dairy products were, for the first time, identified within some of the Globular Amphora and Corded Ware vessels. Moreover, some bowls and amphorae may have been used to process plant foods, whilst birch bark tar was detected in some Neolithic and Bronze Age pots. Our study did not reveal any significant temporal change from the Subneolithic to the Early Bronze Age, for instance in the processing of domesticated plants.

Heron, C., Craig, O. E., Lucquin, A. J. A., Steele, V. J., Thompson, A., & Piličiauskas, G. (2015). Cooking fish and drinking milk? Patterns in pottery use in the southeastern Baltic, 3300-2400 cal BC. *Journal of Archaeological Science*, 63, 33-43.

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TEXTILES IN ANCIENT ICONOGRAPHY

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Zuchowska, Marta (Institute of Archaeology, University of Warsaw) - Brøns, Cecilie (Harvard Center for Hellenic Studies) - Harris, Susanna (School of Humanities, University of Glasgow)

Format: Regular session

Textiles have largely disappeared from the archaeological record, which makes a study of them something of a challenge. A study of ancient textiles must therefore be based, to a large extent, on secondary sources. Iconography is a particularly crucial source of information about ancient textiles and dress, especially in societies where we only have limited written sources.

However, making sense of images can be difficult, although we still tend to take the process of interpreting images very much for granted. A constant problem for anyone interpreting ancient iconography is therefore determining how we interpret what we see. The most important problem with the use of iconography as a source on ancient societies is the extent to which iconography corresponds to reality. Furthermore, reading images is not just a question of decoding a single meaning, since the interpretations of images changes from context to context depending on the various viewers and their expectations.

We warmly welcome papers addressing depictions of dress, textile tools, textile production, as well as textiles for other purposes than dress, such as furnishing textiles etc.

Further questions include (but are not limited to):

How do the depictions relate to the medium in which, or the artefact on which they are represented?

How do the depictions of dress relate to our knowledge of ancient garments and/or written sources?

How were depictions of textile tools used to reflect social practices and traditional values?

How do we assess the possible religious aspect of the depictions of textiles and textile production?

ABSTRACTS

01 ANALYZING AND INTERPRETING TEXTILE ORNAMENTS COVERING THE BRONZE AGE ANTHROPOMORPHIC STELE FOUND IN THE MEGALITHIC AREA OF SAINT MARTIN-DE-CORLÉANS (AOSTA)

Author(s): Zidda, Gianfranco - Schoenholzer Nichols, Thessa (Regione autonoma Valle d'Aosta)

Presentation Format: Oral

One of the themes proposed in the iconographic study of the stele of Saint Martin-de-Corleans in Aosta, is the diversity of the dress and/ or the presence of arms.

The confrontation within the Aosta group and the Sion group of Switzerland, has shed new light on the forms, composition, and the significance of textiles and garments present or not on the figures. To help the study, a non-archeologist, but a historian of costumes, textiles and textile techniques, as well as theoretician of classification procedures of these materials was consulted. Considering the difficulties of fixing chronological differences between the more archaic stele and the more recent ones, and therefore imagine the possible initial moment of evolution and variations of the decorative patterns and maybe the commencement of the decorative concept, it was necessary to organize somehow these complex and iconographic designs.

The reading and the interpretation is often very difficult because of later adaptation or coverings with new incisions. The methodology used, has offered the possibility of creating standards and norms, by dividing the surface of the monolithical plates. One becomes aware of a variety of garment types such as shirts which cover the upper torso, parallel panels, some even draped, skirts consisting of horizontal bands, particular cuts that could indicate the presence of sleeves, decorated bands with complex textile techniques. Even if these findings cannot be proven, they offer all the same interesting archeo-ethnographic confrontations to identify maybe the social status of the represented persons and more.

02 ILLUSTRATING FABRICS AND DRESS IN THE AEGEAN NEOLITHIC

Author(s): Sarri, Kalliopi (Centre for Textile Research - CTR, Saxo Institute, University of Copenhagen)

Presentation Format: Oral

Knowledge on fabrics and clothing in the Neolithic Aegean is difficult to approach since archaeological textiles have not been found and there is little and unclear evidence from the iconography. What we know about the textile production and the Neolithic costume is based on tool finds and some iconographic evidence of puzzling interpretation.

Textile decoration, however, was often adopted as a craft transfer by the Middle and the Late Neolithic potters and thus provides us with indirect information for the recognition of specific weaving and decorative techniques. Tracing costume elements can be achieved through the detailed study of a relatively small group of anthropomorphic figurines and objects, which - despite their abstraction and the limitations of their small scale- give us valuable data about the production and the decoration of fabrics and clothing of this period. Both these sources, particularly their combination, testify the existence of elaborate textiles of high quality and very sophisticated fashion couture, with a tendency for exaggeration and luxury, culminating in the early phases of the Late Neolithic.

This paper aims at tracing representations of fabrics, garments and accessories in various expressions of the Neolithic figurative art, mainly figurines and ceramics, focusing on local traditions, foreign influences and artistic loans. Reference will be made to technical iconographic issues, for instance, how Neolithic illustrators solved the problems of depicting costume elements on a tiny scale, how they set iconographic priorities and choices, and what technical means and tricks they used. Finally, it will discuss how the illustrations of fabrics and clothing items can help us to appreciate the skills of the artists and the level of maturity of figurative art in the Neolithic Aegean and its neighbouring regions.

03 TEXTILE PRODUCTION IN AEGEAN GLYPHIC. ON INTERPRETING SMALL-SCALE REPRESENTATIONS ON SEALS AND SEALINGS FROM BRONZE AGE GREECE

Author(s): Ulanowska, Agata (Institute of Archaeology, University of Warsaw)

Presentation Format: Oral

For more than 100 years Aegean glyptic has been widely explored as a valuable source of information about many aspects of life in Bronze Age Greece. Intensive research has been undertaken into the sphragistic use of seals, their remarkable iconography, as well as symbolic and talismanic function of seals. Iconographic depictions that may be related to textile making have been recognised only recently, demonstrating that the relevant evidence is available and advanced iconographic studies of textile production in the Aegean glyptic art are promising. These recent observations, revealed motifs that possibly depict loom-weights and the warp-weighted loom(s), motifs referring to raw materials, such as woolly animals or fibre plants, as well as symbolic references, e.g. spiders.

In my new research project investigating relations between textile production and Aegean seals and sealing practices, I aim to re-examine the imagery of glyptic with a reference to the recently enhanced knowledge of textile technology in Bronze Age Greece and identify multiple relations between textiles and seals. In this paper, I will discuss the key methodological issues required by this study, such as the basic conventions and constraints that exist in Aegean glyptic iconography, as well as methods and assumptions I adapt in order to decode the motifs potentially related to textile production. This will include comparative studies of iconography of textile production and, specifically, small-scale representations in Mesopotamian glyptic where several references to various sequences of textile making have already been discussed in detail by Catherine Breniquet. The question whether any repetitive patterns of display of motifs and more complex iconographic programmes may have existed (and how to recognise them), will also be addressed.

04 WHAT DID A 'CARPET' LOOK LIKE? MYCENAEAN TE-PA AND ITS REPRESENTATIONS

Author(s): Pierini, Rachele (University of Bologna)

Presentation Format: Oral

The Mycenaean term *te-pa* has been tentatively linked to alphabetic Greek *τάπης* 'carpet'. Texts like Homer's poems seem to show that *τάπης* referred to a broad range of items, such as a cushion (Il. IX 200), a pillow (Od. X 12), or a blanket (Il. XVI 224). Thus, *τάπης* seems to have a much wider range of meanings than its translation as 'carpet' would suggest. Linear B tablets attest the term *te-pa* by means of a ligature (TELA+TE) made up of the textile logogram TELA and the acrophonic abbreviation TE. Given that on Mycenaean documents logograms and ligatures are expressed by means of drawings and that this ligature in particular shows the actual graphic representation of the item recorded, this piece of evidence provides us with both textual and iconographic information related to the same item at the same time.

The aim of this paper is to analyse Mycenaean tablets recording *te-pa*, TE, and TELA+TE both from a textual and an iconographic point of view. Moreover, *te-pa* has been connected to the religious sphere, and this alleged usage will also be taken into account. In the light of this examination, the current interpretations of *te-pa* will be reviewed and, eventually, some arguments will be put forward for a different, perhaps more convincing, reading of the term.

05 CLOTH OR CLOTHING? PROBLEMS OF AMBIGUITY IN AEGEAN LATE BRONZE AGE RELIGIOUS ICONOGRAPHY

Author(s): Boloti, Tina (Greek Ministry of Education, Research and Religious Affairs)

Presentation Format: Oral

The implication of cloth and/or clothing in ritual actions is amply testified in Aegean Late Bronze Age iconography. Nevertheless, their identification involves problems related to both our main iconographical sources, i.e. wall paintings and various sphragistic media (signet rings, seals and seal impressions/sealings). Pictorial wall paintings, which appear in Crete from late MM III and spread afterwards to Cyclades, Rhodes, Miletus and Mainland Greece, are in their vast majority poorly preserved, with the exception of Akrotiri (Thera) frescoes. So, we deal with partial (often) or dubious (occasionally) restorations, let alone the stylistic conventions. Drawing upon a common iconographical tradition, the much richer seal imagery, from the 16th century B.C. onwards, often fills the gaps of the fragmentary wall paintings. Usually however, features related to the limited sphragistic surface (miniature scale, lack of details, schematization), as well as the occasional poor preservation of the scenes, make their interpretation difficult. Data offered by miscellaneous media (figurines, vases, sarcophagi, faience models etc.) remain valuable though disparate.

Despite the problems of ambiguity arisen, I aim at discussing the types of cloth and clothing detected in Aegean Late Bronze Age religious iconography and their role in specific rituals, with reference to their possible correlation with terms testified on Linear B tablets.

06 CLOTHING ON THE ARCHAIC GREEK KORAI: A TEXTILE APPROACH TO ICONOGRAPHY

Author(s): Harris, Susanna (University of Glasgow)

Presentation Format: Oral

The Greek Korai are sculptures of elaborately dressed young women, carved from marble, engraved with patterns and painted with bright colours. They iconic artefacts of archaic Greece (c.650-500 BC). Art historians recognise the Korai for their fine sculptural qualities. Recently a number of the sculptures have been revaluated for their surface pattern and polychrome, adding a rich layer of knowledge to the way the stone sculpture was originally decorated, especially in terms of their clothing. In the classification and interpretation of the clothing scholars tend to be less enthusiastic. The clothing represented on the sculptures does not always fit into the established understanding of Greek female dress of peplos, chiton, mantle and himation; a schema found in both contemporary text and the academic canon. Possibly for this reason the clothing is often described as confused or unrepresentative of actual garments and dismissed as artistic fantasy.

In this paper, I propose an alternative approach. I take as a starting point that the sculptors and painters were likely knowledgeable of the material culture that surrounded them, even if they worked within a stylistic framework. On this basis, the focus of analysis will be on understanding the textiles represented on the Korai. The textiles will be considered for their size, texture, patterns, drape, colour and borders, which is analysed through the evidence of sculptural shape, position, engraved pattern and painted colour. The textile iconography will be compared to evidence of archaeological textiles, their material qualities and technical potential. From this perspective, I suggest that the original artists sought to demonstrate the fineness and complexity of their textile tradition, and that the quality and quantity of textiles for clothing was one of the prime features they wished to represent.

07 SAFFRON MANTLES AND “MARKED” DIVINITIES

Author(s): Martin, Daphne (Yale University)

Presentation Format: Oral

This paper makes use of color reconstructions of the Peplos Kore (Acropolis Museum, 679), as informed by Brinkmann et al. (2007), to argue that (1) the statue can be identified as Artemis Brauronia, and (2) the saffron-yellow color of her mantle was a “marker” of her divinity, as well as a reference to rituals associated with the goddess’s worship within her Attic sanctuaries. Literary evidence from the Classical period suggests that saffron was a “marker” of divinity on the Athenian Acropolis for both Artemis and Athena (for Athena, see: Eur. Hec. 465-74). The Brauron Clothing Catalogues from the Athenian Acropolis, listing numerous dedications of saffron-colored garments to Brauronian Artemis in the years 355-336 BCE, strengthens the conceptual relationship between Artemis Brauronia and yellow textiles. To these well-known inscriptions can now be added the visual evidence from a fragmentary white-ground kylix (470-450 BCE), found in Artemis’s sanctuary at Brauron, which depicts a young girl offering a vibrant yellow cloth at an altar. Furthermore, Aristophanes’ *Lysistrata* relates that girls at the *Arkteia* festival wore the **κροκωτός**, a saffron-colored robe (44, 645). The Brauron Clothing Catalogues mention a cult image at Brauron wearing such a dedicated garment: **Κροκωτὸν διπλοῦν ποικίλην τὴν πεζίδα ἔχει τὸ ἄγαλμα τὸ ὀρθὸν ἔχει** (“a double-layered *krokotos*, patterned, it has ribbons, the upright statue has it” IG II2 1522.28/9), while Pausanias (2nd c CE) describes a 4th-century BCE statue of Artemis attributed to Praxiteles at the Acropolis Brauroneion (1.23.7). The goal of this paper is to incorporate the Peplos Kore as an additional visual link between Artemis Brauronia, Athenian girls, femininity, and saffron textiles. In doing so, “markedness” is defined and demonstrated within the Athenian religious context, and color is shown to be symbolic and aesthetically appropriate for invoking divinity in ritual performance.

08 THE VEIL OF DESPOINA AT LYKOSURA

Author(s): Dimopoulou, Sotiria (PhD Student)

Presentation Format: Oral

The dressing of the cult statues in ancient Greece is an important part to the study of textiles and its iconography. The cult group of Damophon at Lykosura in Arcadia, Peloponnese belongs to the original hellenistic statues (2nd century BC) and was found on site at the Temple of Despoina. The colossal sculptures, which are very fragmented, are consisted of four over-life size figures: Artemis, Demeter, Despoina and Anytos. Demeter and Despoina are seated on a throne. flanked by standing figures of Artemis and Anytos.

Literary evidence of the existence of the group is given by Pausanias, who saw and described the cult statues during his visit to Greece in the 2nd century AD. Inscriptions of the Roman Period, found during the excavations at Lykosura, prove the significance of this cult in ancient Arcadia.

All female statues were dressed with garments (chiton, peplos or himation), but the honored figure was dressed with a decorated relief veil, which was draped over the head and reaching down to the knees. A large part of the veil of Despoina is exhibited in the National Archeological Museum, Athens. The marble of the veil shows traces of red colour and is divided in friezes decorated with thunders, Tritons, dolphins, Nereids, Nikai carrying censers and also humans with animal-heads in a dance procession like a ceremony. The veil of Despoina allows diverse iconographic interpretations due to its decoration, which is connected with the cult at Lykosura.

09 GARMENTS OF THE GODS. ON INTERPRETING CLOTHING ON DEPICTIONS FROM THE CLASSICAL PERIOD

Author(s): Streicher, Martin (Classical Archaeology at the Universities of Mainz and Bonn)

Presentation Format: Oral

What are the meanings of garments on ancient depictions? Is there a thematic correlation between clothing and the wearer? What significance do these elements have for our interpretations? So far, these fundamental questions have only scarcely been touched upon with regard to the Classical Greek Period. Interpretative approaches often purely rely on social identification models. But can the choice of garments depicted be interpreted solely with monocausal explanatory models?

If one looks at the polyvalent Greek myths, it becomes apparent that for a certain figure several, often co-existing role models exist. An in-depth examination of the iconography of female garments on the basis of the sculptures of the fifth century BC has revealed that a differentiated understanding of the myths is also reflected in their clothing. For example, Nike, which would be well suited for a well-assigned dress pattern, is presented in different variations of the Peplos. These and other sculptures from classical antiquity prove that the reasons for choosing a particular garment are complex. Instead of approaching this phenomenon with a monocausal premise in mind, different, additive levels must be taken into account when interpreting garments. For example, depictions of the goddess of victory often draw upon the display of fast movement, flying and the influence of the elements whereas the social meaning is more a connotation superimposed by other contents. I will argue that the choice of garment was influenced by many different factors (e.g. context, movement patterns, timing, functionality, scene) which have to be taken into account for the interpretation. In my presentation, I will offer a methodical contribution for a systematic, polycasual approach to the interpretation of antique garments which has not yet been formulated clearly. This provides a deeper understanding of clothing as a polyvalent information carrier beyond the social role of the wearer.

10 WHERE WOULD YOU PUT YOUR CLOTHES? ON DEPICTIONS OF GARMENTS DISPLAYED ON STOOLS IN GREEK VASE-PAINTING

Author(s): Bednarek, Bartłomiej (University of Warsaw; British School at Athens)

Presentation Format: Oral

Although the way we handle clothes having taken them off or before putting them on may seem perfectly obvious within a given culture, it is a culturally specific phenomenon and, to a large extent, belongs to the field of what M. Mauss called techniques of the body. Ancient Greeks did not leave any ethnographic account in which this aspect of their culture was treated at any length; however, some pieces of literary data indicate that they would usually display their garments on stools or chairs (which may seem familiar to many of us, but shall not be taken for granted). Apart from this, there is a vast corpus of depictions in vase painting (thus far, I was able to identify no less than 50 unambiguous pieces; the number is growing) of garments set on a stool/chair, transported on it, or in the process of being put there. The motif seems to have been so profoundly embedded in Greek imagery that also an empty stool set in a gynaikion sometimes clearly suggests that a woman depicted on a vase has just accomplished her dressing (often bridal dressing) or is just about to undress. Less common, although still well attested, are depictions of males using stools/chairs in a similar way. Finally, there is some data to suggest that a word *diphrophoros* (stool-bearer) was a comic formation (used roughly in the time of Aristophanes) that referred to a girl responsible for carrying a stool, which was conceived of as a tool and an attribute of her function as a dresser/embellisher, indicating that within Greek imagery, the stool was intrinsically connected with the process of dressing.

11 FURNITURE TEXTILES IN CLASSICAL AND HELLENISTIC ICONOGRAPHY

Author(s): Andrianou, Demi (National Hellenic Research Foundation)

Presentation Format: Oral

Inventories, such as the one taken at Hardwick Hall in Derbyshire in 1601, demonstrate that beddings and fabrics were far more expensive and valuable than wooden furniture in the seventeenth century AD. In the ancient world practices such as the stuffing of chairs and couches with soft materials and the covering of the stuffed parts with fabric tacked to the wooden frame, are unknown. However, comfort was sought through different kinds of furnishings, as evidenced in the excavated record and, to a greater extent, in the visual representations of furniture on vase paintings and reliefs of the Classical and Hellenistic period. Pillows, sheets and mattresses on klinai or pillows on footstools signify the need for comfort. Textiles were used instead of architectural elements to denote the separation of spaces. Decorated wall paintings on the ceiling of Hellenistic tombs may denote an allusion to baldachins over klinai. Mosaics mimic rugs and mats in wealthier domestic settings. Along with the visual record, equally rich literary evidence assists our understanding of the use and value of ancient textiles. Heracleides, for instance, quoted by Athenaios, mentions bed-makers (στρώται) first instituted by the Persians in order to ensure beauty and softness in coverings, something evidenced in the banquet scene on the wall-painting of the Agios Athanasios' tomb in Macedonia. The care taken to store or preserve textiles is evidenced on the depiction of the Lokri plaques, where textiles are stored in large chests, and through the literary mentions of bed clothes smelling of roses (ροδόπνοα στρώματα) or sweet smelling bedclothes (ήδυόσμοις στρώμασι). Expensive garments that were worn could also be doubled as tapestries and be hung on the walls, as evidenced on Hellenistic banquet reliefs from Samos. Reversible blankets (ἀμφιτάπις) are most probably depicted on certain funerary reliefs of Asia Minor and Thrace.

12 GREEK GODDESSES AND BEAUTY CONTESTS: DIVINE FASHION

Author(s): Liveri, Angeliki (Greek Ministry of Education, Research and Religious Affairs)

Presentation Format: Oral

This paper presents depictions of the goddesses Hera, Athena and Aphrodite during their participation in the beauty contest, known as the Judgment of Paris, at Mount Ida; Helen's representations are also including, if it is necessary for comparisons: Helen, the most beautiful mortal woman of Ancient Greece, was offered by Aphrodite as prize to Paris. According to Ancient Greek sources the three goddesses went to this event wearing their most beautiful garments, jewelry and accessories. Hermes accompanied them to the appointment with Paris who acted as the judge. Hera's and Aphrodite's elegance is also known and is evident in many other occasions before the contest, which are depicted in vase paintings. In terms of fashion Athena was the less interesting goddess; however, she is associated with the textiles.

This paper attempts to show and classify the garments of the goddesses and Helen, which are similar to the contemporaneous noble or upper class dresses, showing selected examples. References in written sources are compared and combined with depictions in vase paintings from the Archaic to Classical period, focusing in Attic vessels. A comparison of representations made in workshops of other Ancient Greek locations will be made, when necessary, to show similarities and differences in textiles and fashion. It is also interesting to demonstrate the differences between the goddesses' garments, if we can identify them: Athena can be easily identified because of the helm and the aegis. Thus the development of the Ancient Greek fashion will be shown depicted in contemporaneous vase paintings.

13 'BEASTIE-STYLE': LITERARY AND ICONOGRAPHICAL EVIDENCE FOR PATTERNED TEXTILES IN ANCIENT GREEK CULTURE

Author(s): Caspers, C.L. (Murmellius Gymnasium)

Presentation Format: Oral

Hesychius preserves the gloss: θηροειδεις· έφαπτιδες ποικιλως διηθησμενοι ('Beastie-style: garments with a variegated floral pattern'). This gloss raises questions about the phenomenology of ancient Greek textiles and about the significance of the terms that describe them. How can a 'floral pattern' (διηθησμενος < άνθος 'flower') suggest the look of a 'beast' (θηροειδής < θήρ or θηριον 'animal')? Does the pattern have to be 'variegated' (ποικίλος) in order to qualify as 'beastie-style'? Why are the ontological categories 'animal' and 'floral' not mutually exclusive when we speak about garments? And, given that both 'animal' and 'floral' are symbolical as well as descriptive terms ('animal' = wild / uncivilized; 'floral' = young / vulnerable), what did it mean for a man or a woman (or a god) to wear 'beastie-style'?

My paper consists of:

- a lexicographical analysis of the terms involved in Hesychius' gloss;
- a full discussion of textile patterns as depicted on Greek vase paintings from ca. 680 to 320 BCE, showing that, while floral-patterned textiles are ubiquitous in BF and in post-400 BCE RF paintings, alternating with plain or abstractly patterned textiles, depictions of animal-patterned textiles (as e.g. on the Pronomos-vase, ca. 380 BCE: stylized horse-heads) are very rare; and
- a re-evaluation of a key literary attestation of an 'animal-patterned fabric' (Aeschylus, Choephoroi 232: θηρεϊος γραφη).

I conclude that, whereas the evidence for ancient Greek animal-patterned textiles is limited, variegated (ποικίλος) patterning evidently gave garments an animal 'look' that, approximating the quality of animal skin, warranted the label 'beastie-style' (θηροειδής). An ambiguity results, with floral patterns suggesting youth/vulnerability, while the patterning's ποικιλία suggests feral wildness;

and I demonstrate that vase-painters exploited this ambiguity, especially in their depiction of female figures in extreme situations.

14 TEXTILES IN CLOTHES AND CLOTHS IN THE DIONYSIAC FRESCO IN POMPEII. SIMPLY FASHION OR SEMIOTIC FUNCTION?

Author(s): Lindstrom, Torill Christine (Dept of Psychosocial Science, University of Bergen; SapienCE, Centre for early Sapiens Behaviour, CoE, University of Bergen)

Presentation Format: Oral

“The Dionysiac Fresco” in the Villa of the Mysteries (Villa dei Misteri) in Pompeii, Italy, is probably the most famous, possibly the best preserved, and definitely the most debated fresco-cycle from Roman antiquity. It contains lots of textiles, garments as well as other. This fresco has been given numerous interpretations. The interpretations have been mainly connected to the behaviour of the persons in the fresco, the fresco’s total composition, and the fresco’s visual references to Dionysiac mythology and rites, including divinations and initiations. However, I claim that the fresco contains data that are still poorly explored and explained, in particular the textiles. This paper will present a full registration of the garments and other textiles in the Dionysiac Fresco; and will focus on possible semiotic elements connected to them. – I demonstrate that certain colours and colour-combinations can be found both in the persons’ costumes and in other textiles. A statistical chi-square analysis revealed that these colour combinations are not arbitrary, but carefully chosen. This finding may have relevance for the interpretation of the Dionysiac Fresco. I suggest that it is possible that particular symbolic colours and dress-codes may be hinted at, or even spelled out in the fresco. Fixed dress-codes and colour-symbolism often have particular functions in religious societies and rites. They have semiotic functions. So, finally, in this paper I relate the dress-codes in the fresco to other information (written sources) about Dionysiac congregations (thiasoi).

15 A COLOURFUL PAST: THE RENDERING OF GARMENTS IN ANCIENT GRAECO-ROMAN SCULPTURE

Author(s): Broens, Cecilie (Harvard Center for Hellenic Studies; Ny Carlsberg Glyptotek)

Presentation Format: Oral

In the ancient Mediterranean area, the textiles have usually disappeared from the archaeological record, which means that our knowledge of their original colours is limited and to a large extent based on secondary sources. Besides the literary and epigraphic evidence and knowledge of ancient dyes, one of our most important sources is iconography. When dealing with the Graeco-Roman period, this presents a double challenge, since the original colours of art and architecture due to their fragile nature usually – like the textiles – have disappeared. Nevertheless, a few traces of the original colours of these artworks are sometimes preserved and careful scientific examinations of the original polychromy can therefore provide valuable information to increase our knowledge of the depictions of ancient Graeco-Roman garments.

The present contribution presents the investigations of the polychromy of a number of Graeco-Roman marble sculptures, carried out by the interdisciplinary research team at the Ny Carlsberg Glyptotek in Copenhagen, Denmark. These investigations were performed with different scientific methods including visible induced luminescence (VIL), ultraviolet fluorescence (UVF), and X-ray fluorescence (XRF). The research team has proved the existence of the often rich and varied colours and decoration of ancient Graeco-Roman sculptures, which is in stark contrast to the common perception of ancient garments being primarily white.

16 FRINGED CLOTHING IN ROMAN ART

Author(s): Olson, Kelly (University of Western Ontario)

Presentation Format: Oral

This paper will examine the presence and meaning of fringed garments in Roman art and literature. Usually, fringe was simply the warp end of weaving left unfinished (Barber 1991, 274) although inlaid fringe does occur (ibid, 151-2). While it appears on Egyptian and Persian garments with some regularity (Barber 1991, 146-7; Cleland et al. 2007, 74-5), and to a certain extent on Greek, fringed garments in Roman society do not seem to have been as common.

In Latin literature, fringe is described as being on some religious garments (such as the *rica*; Fest. 368L; Paul ex Fest. 369L; and on the cloak of the goddess Isis at Apul. Met. 11.3). Fringed blankets are described at Var. L. 5.79 and Cels. 2.6.6. But it is also implied that, at least in the late Republic and early Empire, fringes were effeminate or somehow inappropriate wear for a man: Caesar is described as being “remarkably” dressed in a tunic with fringed, wrist-length sleeves (*usum enim lato clavo ad manus fimbriato*; Suet. Iul. 45.3). The upstart Trimalchio wears at his neck a napkin with a broad stripe and fringes hanging from it all round (*laticlaviam immiserat mappam fimbriis hinc atque illinc pendentibus*; Petr. Satyr. 32).

We see clothing fringe on a bronze statuette of an Etruscan priest now in the Vatican (fourth century BCE); on the military paludamentum of a bronze statue of Augustus (12-10 BCE; found in the Greek east); on garments on the Ara Pacis (two women and two young boys); and on a cloak on a female statue now in the Capitoline Museum at Rome (late second- early third century CE), among others. This paper will examine the technology of fringes and the appearance of fringe on garments as well as its cultural resonances, whether effeminate, Eastern, Egyptian, or religious.

ARACHNE REVISITED: HUBRIS AND TECHNOLOGICAL SOPHISTICATION IN THE FRIEZES OF DOMITIAN'S MINERVA TEMPLE

Author(s): Öhrman, Magdalena (University of Wales Trinity Saint David; Centre for Textile Research, University of Copenhagen)

Presentation Format: Oral

This paper focusses on the frieze of the temple of Minerva in the Forum Transitorium, conceived under Domitian. The identification of the frieze's main motif as the weaving contest between Minerva and Arachne (elaborately described in *Ov. Met.* 6.5-145) is still debated: D'Ambra's identification of the crouching woman in the central panel as Arachne is only tentatively accepted in J.P. Wild's discussion of Roman loom types, and mentioned as unsubstantiated in the LIMC article on Arachne. By looking beyond Ovid to the *Astronomica* of Manilius (4.128-139), this paper assesses the contemporary appreciation of the Arachne story as a cautionary tale as well as the purpose of repetitive features in the large number of process-focussed frieze panels depicting various stages of cloth preparation.

The paper suggests that the prominent display of the motif of wool-work, alongside the cautionary tale of Arachne's hubris, offers an imperial response to an emerging stoic paradigm of uxorial loyalty, where wives supporting or outshining their husbands in moral strength are lauded despite transgressing normative female behaviour. Domitian's renewed emphasis on wool-work as a paradigmatic female activity here instead reinforces the prominent statebearing role of Roman wives. Yet the frieze also showcases the economic value of traditional textile work. The detailed depiction of textile tools (scales measuring the amount of wool to be spun, spindles, distaffs, pin-beaters, etc) and the repeated display of a loom-type rarely paralleled at the time focus on the potential output of female industriousness, expertise, and technological development.

D'Ambra, E. 1993. *Private lives, imperial virtues, the frieze of the Forum Transitorium in Rome*. Princeton, N.J: Princeton University Press.

Szilágyi, J. G. 1984. "Arachne", *LIMC* II.1: 470-471.

Wild, J. P. 1992. "The Roman Loom in the Western Europe: The Evidence of Art and Archaeology". *Vlaamse Vereniging voor oud en hedendaags Textiel Bulletin* 12-16.

TEXTILES IN THE ICONOGRAPHY OF ROMAN PALMYRA

Author(s): Zuchowska, Marta (Institute of Archaeology, University of Warsaw)

Presentation Format: Oral

Palmyra is one of the very rare archaeological sites dated to the Roman period where abundant organic materials survived, including a big group of fabrics. Among them, pieces of over 500 diverse textiles were documented, all dated to the period between the 1st and late 3rd c. AD. In the same time, archaeological research in Palmyra brought to light numerous iconographic representations, mostly funerary sculpture but also some wall paintings, showing a wide spectrum of clothing and fabrics worn by Palmyreans. The analysis of archaeological and iconographic material from Palmyra gives us a unique opportunity to verify how the artistic vision of Palmyrean artisans corresponds to reality. On the other hand we should bear in mind that textiles preserved in Palmyra come from a very specific – funerary context, thus they do not show all varieties of every-day and official dress. The aim of this paper is to discuss how the data coming from these both categories of sources – archaeological textiles and their iconographic representations – overlap or supplement each other and to how extent we can use them to create a complete picture of Palmyrean clothing.

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PIECING TOGETHER IDENTITY: DRESS IN MOSAIC ICONOGRAPHY

Author(s): Place, Amy (University of Leicester)

Presentation Format: Oral

As a popular form of elite self-expression, mosaic iconography offers a glimpse of important, physical, mechanisms of identity construction and projection in the late antique world. Such images tell us how, to some extent, late antique individuals wanted to be perceived. Social status and prestige would be conferred and confirmed through such modes of display. Clothing, similarly, provided a system by which cultural allegiances could be announced and social hierarchies maintained. Yet, 'reading' identities directly from mosaic iconography is not simple. Dressing the body was a process laden with meaning and constituted a complex dialogue between the individual, their audience, and respective cultural frameworks. Similarly complex processes were involved as part of depicting clothed bodies in mosaic iconography.

This paper offers a close reading of select examples of late antique mosaics to unravel key issues faced when interpreting 'dress' from mosaic imagery. When decoding dress from visual material, it is important to remember that this 'dress-image' does not exactly correspond with its physical counterpart. Yet, moving beyond ideas of dress purely as a material garment and framing discussions instead around abstract, visual clothing enhances our understanding of another of clothing's cultural functions. As meaningful instances of cultural production, mosaic imagery, and the depictions of dress contained within, spoke to the viewer. Iconographic resonances showcase a different, but still significant, arena in which elite competition was undertaken. Patrons could enact their identity and status through clothing. Unpicking how this process occurred and manifested itself in mosaic iconography offers an exciting glimpse at how visual dress could be employed as an identity signifier.

20 FROM TOP OF THE HEAD TO TIP OF THE TOES: APPAREL FOR INTERACTION WITH ALTERNATE WORLDS IN LEVANTINE PREHISTORY

Author(s): Levy, Janet (Ben-Gurion University of the Negev)

Presentation Format: Oral

Natufian (13000 BCE) ritual attire recovered from burials, features idiophonic canine teeth girdles, strung shell and bone bead headwear, and also paired gazelle horns, a marker for shamanistic activity. Female figurines featuring elementary headwear were recovered from PPNA, 9th millennium BCE, domestic discard contexts, suggesting magical manipulation by females. A representation of a girdled female tightly cached with a polished axe, the male principle, is indicative of magical procedures to influence fecundity. Nahal Hemar, an 8th millennium desert, cultic venue, with a strongly male orientated artifact assemblage, consistent with shamanistic activity, features invested open work mesh headwear of linen yarn and glinting manufactured beads. Ain Ghazal, 100 kms to the north-east, attests to two caches of large plaster, planar statues. All are naked. Their dimensions and fragile nature indicates short lived, organized public ritual.

Sha'ar Hagolan, 7th-6th millennium, features clay figurines of seated females of large dimensions, but sexually subdued, with an intimidating mien wearing standardized attire, waistcoats and towering headwear. They were recovered, all broken, from domestic trash contexts, indicative of manipulative magical procedures. The Chalcolithic (5000-3900/3800 BCE) features multi-layered frescoes in domestic dwellings with representations of hybrid androgynous cultic officials in ritual situations, demonstrating hierarchy, wearing horned masks and woven gowns and also seated and shod dignitaries participating in ceremonies with cosmological content. There are artifactual correlates; full body size linen garments and leather footwear.

There is an observable development, although not linear, in costume elaboration from elements acquired from the wild and essentially assembled as is, to gowns of woven cloth and footwear. Headwear dominates the clothing repertoire. The advent of domestic flax in the 8th millennium engendered a transition to fine, thigh spun yarn worked into labour intensive finger weave fabrics and ultimately into spindle spun yarn woven into textiles on the mechanized horizontal ground loom.

21 IS IT A LOOM OR A LYRE: A DUAL READING OF ICONOGRAPHY FROM THE IRON AGE II LEVANT

Author(s): Nelson, Thaddeus (Stony Brook University)

Presentation Format: Oral

The material record of textile production in the Iron Age II Levant (c. 1000-586 BCE) is unusually rich. Thousands of loom weights and spindle whorls demonstrate that spinning and weaving were nearly ubiquitous components of life from households to temples. This record results in reconstructions that place singular importance on the warp-weighted loom technology: a style of loom suited for large loosely woven fabrics. Yet, this may be a result of preservation bias favoring the loom weights made of stone and clay over tools used in other technologies that were made from organic materials. This paper argues that scholars have overlooked iconographic evidence of a method of small textile production, because the images are described as musicians instead of textile workers. An analogy to interpretations of visually similar Greek and Hallstatt images suggests that the validity of both identities creates additional meanings that to be read from the iconography. By interweaving our readings of these images as both lyres and looms, this article suggests a new relationship between music and textile production in the Iron Age. In addition to the use of a previously unknown method of textile production, this conclusion leads to new understandings of the iconography and the social role of weaving.

22 WORKING CLOTHES FOR ANCIENT MINERS. THE SALTMUMMIES FROM CHEHRĀBĀD (IRAN) AND THEIR GARMENTS

Author(s): Groemer, Karina (Natural History Museum Vienna, Prehistoric Department)

Presentation Format: Oral

Albeit there is a wealth of iconography and written sources, original textile finds are rare in Mesopotamia and Ancient Iran. For this some exciting new finds can be named for studying textiles and garments between 600 BCE and 600 CE: the saltmummies from Chehrābād in the north-west of modern Iran. In the year 1994 an ancient salt mummy was found, later archaeological excavations took place by the Zanjan Cultural Heritage centre. In total, well preserved remains of at least six salt mummies, victims of catastrophic mining accidents had been discovered, together with clothes, tools and other equipment. Radiocarbon data allow to place the ancient mining activities to the 6th-4th century BCE in the achamenid period on one hand and on the other to 4th-6th century CE, the sassanian period.

The textiles found in the salt mine are of specific interest. We do not only know there fragments of fabrics with different raw material, colours or pattern types. The most important items are the complete garments of the salt men, but also garments found in the mine. The technical details, how they were woven and tailored, allow us new insights in textile technology of ancient Persia. We also ask for how depictions of garments known from ancient Persia worn by men can be compared to the actual finds of clothing from the salt men. Beside that complement data to other available sources like written or pictorial sources, we learn about the functionality of clothing. It has to be shown that the garments of the salt men are made to perfectly serve the needs of salt miners – both to support movability and to protect during the work in the mine. Also some symbolic features can be traced, such as the use of red cords for the sleeves, openings and side seams.

23 THE BODILY POSTURE OF HAND-SPINNING PRACTICE. EVIDENCE FROM ANCIENT WESTERN ASIATIC REPRESENTATIONS AND ETHNOGRAPHIC COMPARISON

Author(s): Schoch, Chiara (Freie Universität Berlin)

Presentation Format: Oral

Spinning fibre to yarn by hand is the most time-consuming step within the process of textile production. The tools for this practice can vary from simple sticks to spindles or even the mere use of hands. Spinning can be practiced in various positions: sitting down, standing, or even walking. The practice itself is highly repetitive and requires a set of very mechanized motor skills acquired through the learning environment and the community of practice. The way tools and raw materials are handled as well as the bodily posture are forms of embodied knowledge and might be recognisable on depictions. Since spinning tools are rather small, only seldom they can be securely identified even on very detailed depictions. Assuming that the pictures are intended to be understood in their emblematic meaning, it is probable that a distinct poise of body might stand for the spinning practice itself. An analysis of posture can help identifying the process of spinning on less detailed depictions and thus possibly enlarge the body of evidence.

In this paper, I address these issues analysing pictorial sources for body posture of spinning persons from the 4th and 3rd Millennium BCE in Western Asia. I also propose some diachronic comparisons with more recent iconographies and ethnographically documented spinners.

24 RE-DRESSING PIABRM – ANCIENT TEXTILE ICONOGRAPHY IN THE SHADOWS OF A CARIAN-EGYPTIAN GRAVE STELA OF THE 6TH CENTURY BC

Author(s): Dyer, Joanne (The British Museum, Department of Scientific Research) - Villing, Alexandra - Morton, Kate (The British Museum, Department of Greece and Rome)

Presentation Format: Oral

For centuries, foreigners living in ancient Egypt embraced Egyptian customs of life and death while adhering to their own cultural traditions, shaping a new, 'mixed' identity. Evidence for this are the artistically rich 'hybrid' tombstones found at 6th century BC Saqqara. Typically erected for foreign mercenaries and their families stationed in the nearby city of Memphis, many of them marked the tombs of Carians, people from western Asia Minor who lived in close cultural exchange with Greeks.

An important example of these cross-cultural grave monuments is the stela of Piabrm, a Carian woman (British Museum EA 67235; c. 540-530 BC), which mixes Egyptian, Greek and Carian elements with great syncretic flair and is arguably the most detailed example in this class. Significantly, it also preserves rare traces of paint. Its three registers, carved in low relief, show two scenes relating to Egyptian funerary cult and one typical Greek scene of mourners around the bier. Despite its rich and complex iconography, the low relief and the effects of weathering make this piece difficult to read and its full interpretation holds many mysteries, not least that of the cultural identity of its maker(s).

In this study multispectral imaging techniques were used to re-evaluate this aspect. Astounding details have been revealed with these methods which may contribute important clues to this question of cultural identity. In particular considerable evidence has been uncovered about the ancient textiles and dress represented in this piece, which is completely imperceptible to the naked eye. As very limited written or iconographic sources survive concerning Carian society and its material culture, this constitutes a crucial resource, contributing to our knowledge of the visual language and iconography that the Caromemphites used to describe themselves and further evidence of the synergy between their adopted and native cultures.

25 IDEOLOGY, GENDER AND TEXTILE PRODUCTION: THE DEPICTION OF WOMEN IN THE IBERIAN CULTURE

Author(s): Basso Rial, Ricardo (University of Alicante)

Presentation Format: Oral

This paper presents an interpretation of the depictions of women of the Iberian society related to textile elements and activities. As it happens in other Mediterranean areas during Antiquity, the depiction of women doing textile works is frequent in the Iberian Culture. Generally, this issue has been related to the expression of the daily activities of the domestic sphere of the Iberian women or as a status symbol of the female of the elite, both ideas clearly linked to the gender identity of women in the Iberian society.

From our theoretical position we consider that to interpret the meaning of these images it is necessary to relate them to an important process that begins to develop in the 6th century BC and is consolidated in the Middle Iberian period (5th-3rd centuries BC): the intensification of textile production. Archaeological works have shown that, from that moment, the presence of evidences of textile tools in settlements and burials, mainly spindle whorls and loom weights, increases considerably compared to previous moments. In turn, Greek and Latin sources tell us about the social importance of Iberian textile production among their women and for their whole society, and its quality and economic significance in the Mediterranean trade. All this seems to show a predominantly domestic textile production, but that could exceed the subsistence needs of the household.

Taking into account this data, we think that behind those images, that represent the gender identity of the Iberian woman, totally linked to the textile world, can hide the dominant ideology of an elite with important interests in textiles products and in the increase of its production to legitimize its appropriation in form of surplus.

a. IMAGES IN THE CLAY: THE ICONOGRAPHY OF THE LOOM WEIGHTS OF VILA NOVA DE SÃO PEDRO (AZAMBUJA, PORTUGAL)

Author(s): Martins, Andrea (UNIARQ - FLUL; Associação dos Arqueólogos Portugueses) - Morais Arnaud, José (Associação dos Arqueólogos Portugueses) - Costeira, Catarins (UNIARQ - FLUL) - Neves, César - Diniz, Mariana (UNIARQ - FLUL; Associação dos Arqueólogos Portugueses)

Presentation Format: Poster

Vila Nova de São Pedro (Azambuja/Portugal) is an iconic calcolithic settlement excavated during more than thirty years, between 1937 and 1968, by Eugénio Jalhay and Afonso do Paço. During those several field seasons numerous artifacts were retrieved and one of the categories of material culture is the loom components, identified in several contexts at the archaeological site. The big majority is undecorated but there are drawing signs in some of them, mostly schematic motifs, but also some sub-naturalistic figures, like zoomorphs. From the analysis of the decorated loom weights of Vila Nova de São Pedro, we intend to present a first approach of the study on the existing iconography, connecting it to the existing schematic art present in other and different contexts in Iberian Peninsula. The technical issues will be analyzed from a functional point of view but relating them according the symbolism of each motif. The recording of specific motifs in utilitarian objects raises several issues related to both the functionality of the object itself and the symbolism inherent to the iconographic motif and the object. The relationship between motifs present in engraved rock or painted rockshelters, traditionally considered as rock art sites, and the identical motifs found in mobile objects will be our main objective in this work.

535 FROM PUBLIC ARCHAEOLOGY TO PUBLIC HUMANITIES: TIME FOR A MORE TRANSDISCIPLINARY APPROACH?

Theme: Archaeology and the European Year of Cultural Heritage

Organisers: Oldham, Mark (Norwegian Institute for Cultural Heritage Research) - Moltubakk Kempton, Hanne (Norwegian Institute for Cultural Heritage Research) - Beck, Anna (Museum Southeastern Denmark)

Format: Regular session

This session takes inspiration from objective (a) of the European Year of Cultural Heritage, namely to “encourage approaches to cultural heritage that are people-centred, inclusive, forward-looking, more integrated, sustainable and cross-sectoral”. In the broader field of heritage and the wider humanities, many of us remain within our own disciplinary boundaries and tend not to communicate with others (neither other heritage professionals nor the public at large); there are many historical and structural reasons for this, but this means that there are few truly transdisciplinary arenas.

Many of the issues we work with require collaborative thinking and broader perspectives, and thus we seek papers that discuss how we as heritage practitioners can work together across subject boundaries to engage the public and increase a sense of public ownership of heritage. As an archaeologist (Mark), a paintings conservator (Hanne) and a curator (Anna), we see how the projects we work with have a resonance with the public, but that we rarely ‘compare notes’ on how best to promote good practices that place the public at the forefront.

This session welcomes case studies from collaborative projects (archaeologists + others + public) as well as discussions on how – or even whether – we should collaborate cross-sectorally in matters of cultural heritage engagement.

ABSTRACTS

01 A REFLEXIVE APPROACH OF THE RESULTS OF THE EUROPEAN NSEARCH PROJECT - NEW SCENARIOS FOR A COMMUNITY-INVOLVED ARCHAEOLOGY

Author(s): Marx, Amala - Salas Rossenbach, Kai (INRAP - National Institute for Preventive Archaeological Research)

Presentation Format: Oral

After 5 years of collaboration, discussions and activities, the NSEARCH project supported by the European Commission in the framework of the Culture programme (2013 - 2018) came to its end. NSEARCH was a network of 16 high-level European structures coming from 10 countries and working in the field of archaeology and heritage, universities, national institutes, local agencies, research labs...

The objectives of this project were to study the different dimensions of public participation in archaeology today and to propose new scenarios for archaeology and heritage intending to foster the relation between contemporary European societies and our realm of expertise. It aimed to understand what citizens think and expect of their relation with heritage; to involve communities in our processes, our decisions; and to understand what it means for us as professionals to find new ways of working and collaborating. We are trying to create contexts to rethink our discipline in order to open our field to more collective and inclusive practices.

We will give through the presentation of some NSEARCH activities a reflexive approach of the results and outcomes of the project. We will discuss the success and challenges of interdisciplinary collaborations and inclusive practices carried out during the time of

the project.

02 BUILDING LOCAL ENGAGEMENT: A COLLABORATIVE EXHIBITION AT ANCIENT NEMEA

Author(s): Langridge-Noti, Elizabeth (American College of Greece; Nemea Center for Classical Archaeology, UC Berkeley) - Shelton, Kim (University of California, Berkeley; Nemea Center for Classical Archaeology, UC Berkeley)

Presentation Format: Oral

A key component of the work of the University of California, Berkeley at the site of the Sanctuary of Zeus at Ancient Nemea in Greece has been the collaborative engagement with the local staff in aspects of the creation and dissemination of information about the site and the surrounding archaeology.

The recently mounted exhibition detailing the reconstruction work on the temple of Zeus at the sanctuary site can serve a key example of this collaboration. First it stressed the involvement of the local reconstruction crew in all aspects of the planning and mounting of the exhibition. Second, in outreach to the public, both local and international, it demonstrated how restoration and reconstruction takes place on a major architectural monument.

The local staff of the Reconstruction Project helped create the impetus for the current exhibition through informational signage composed and constructed by them for the temple, prior to the 2012 Nemean games. The current exhibition takes this signage further by examining the history and process of restoration and reconstruction through the display of machinery, architectural blocks in various stages of work, and signage demonstrating stages of the project over time. It also incorporates the display of some of the restored entablature blocks at ground level; a tribute to the ingenuity of the staff and a much more direct demonstration to the visiting public of the way in which ancient Greek buildings were constructed. The explanatory text and display decisions were a collaborative effort between the archaeologists and the local staff. The involvement of local staff, not just in the actual work of reconstruction but also in the planning and presentation of the material, has increased the local stake in the preservation, not only of the temple itself but also in the broader archaeological heritage of the Nemea Valley.

03 COMMUNITY HERITAGE SCOTLAND - STARTING A WIDER CONVERSATION

Author(s): MacGregor, Gavin (Northlight Heritage) - Gillies, Catherine - Patel, Robin - Tunnicliffe, Anne (Ergadia Museums and Heritage)

Presentation Format: Oral

A large part of Scotland's heritage is managed by volunteers and community organisations, working across a wide spectrum of interests and objectives, including community archaeology, independent museums, historical societies, development or building trusts, but we had no clear picture of this rapidly growing sector.

This paper will present the results of an Early Phase Engagement Project on the Community Heritage of Scotland, which aimed to map and bring about positive change in the sector. The results of an initial survey of Community Heritage in Scotland and conclusions from discussions about establishing a network will be presented.

Scotland's Community Heritage is the first project to focus exclusively on this sector on a nationwide basis, and has come about in response to change and empowerment within communities in terms of the way they manage their heritage. We will reflect on whether the results of the project may help promote better cross-sectoral working and a more transdisciplinary approaches in the future.

The project has been delivered by Ergadia Museums and Heritage with Northlight Heritage.

The Museums, Galleries and Collections Institute at the University of St Andrews supported the research; while funding came from Historic Environment Scotland, Museums Galleries Scotland and the UK-wide Association for Independent Museums.

04 REVEALING HISTORY TOGETHER / THREE PART TIME TEAM

Author(s): Søndergaard, Louise (Museum Skanderborg)

Presentation Format: Oral

In 2017 The Museum of Skanderborg in Denmark invited everybody who had an interest, to take part in an excavation during the annual autumn school break. The object of excavation was a poorhouse from the end of the 19th century. An obvious case for the historical archive, which is already a part of the museum. As the historians plowed the papers, the archaeologists begun to lay bare the actual ruins of the farm.

As we compared the preliminary results not much made sense. The photographs that was supposed to show the farm, had very little to do with the structure that revealed itself from the soil. It was a huge eye-opener, that something as young as 100 years could be this challenging to decipher! Poorhouses were a dark mark of the society of the 20th century, and they were rapidly closed, ruined and forgotten. Without almost no records about daily life, interior or personal belongings, we know very little of these institutions.

Without applying the archaeological method on this object, we would still be counting on the faulty photograph. We wouldn't have any idea about the interior or the objects used here. Without the historians, we would never have figured this to be a poorhouse! We wouldn't have known the timeframe of use, and we wouldn't know the people who inhabited those ruins. Without the workforce of the volunteers we never could have excavated the structure at all. Not only did they represent a surprisingly efficient workforce, they also had as much knowledge as the rest of us when it came to a 100 year old farm. The elder visitors helped identifying multiple structures and objects remembering their grandparents farms, and we all had a notion of revealing history together!

05 HERITAGE ETHNOGRAPHIES: RE-VISITING THEORIES AND METHODOLOGIES TO EXPLORE CONTEMPORARY ARCHAEOLOGY AND SOCIAL IMPACT IN BARCELONA'S GOTHIC NEIGHBORHOOD

Author(s): Pastor Perez, Ana (University of Barcelona) - Ruiz Martinez, Apen (UIC-IES - Universitat Internacional de Catalunya-International Education of Students)

Presentation Format: Oral

The Gothic Quarter, at the heart of Barcelona (Catalonia), gathers together several cultural spaces where ruins (especially Roman) take a prominent role in inhabitant's daily life. Relying on different disciplinary understandings of the city, in this paper, using several ethnographic approaches, we explore how heritage mediates in the constitution of urban places and "non-places" in the Gothic Quarter. We present different methodologies that we have applied to study the relation of the archaeological heritage located in the public space and the social fabric of the Gothic Quarter in Barcelona. Our understanding is that in order to encourage approaches to cultural heritage that are people-centered, inclusive, sustainable and cross sectorial, we need to understand not only how different disciplines and knowledges approach cultural heritage, but also how different collectives, peoples, and associations living in the city dialogue, sometimes even without explicitly knowing it, with heritage in their everyday life. Our work is framed in a political moment that Barcelona privileges participative practices as a tool of social empowerment. In this context we explore how heritage is entering in this incipient institutionalization of participation understood as a tool of social empowerment. In this paper we will bring to light an analysis of methodological techniques applied to archaeological urban heritage. We will also analyse the impact of new ways of transmitting knowledge which improve modern technologies and participatory activities that are also attached to these archaeological urban spaces. Do ruins speak for themselves, and in a different language than the one driven by authorities? Are the recent activist actions that took place in this space having some impact on the inhabitant's perception of heritage?

06 COLLABORATING ON THE COAST: MAKING HERITAGE FOR THE FUTURE AT ORFORD NESS

Author(s): Band, Lara (CITiZAN; MOLA) - Bartolini, Nadia (University of Exeter)

Presentation Format: Oral

CITiZAN, the Coastal and Intertidal Zone Archaeological Network, is an England wide community archaeology project supported from 2015-2018 by the Heritage Lottery Fund and hosted by commercial archaeology company MOLA. Working with local communities CITiZAN trains and supports volunteers to record and monitor sites at risk from erosion along England's coast and estuaries.

Heritage Futures is a four-year (2015-2019) interdisciplinary research programme, funded by the UK Arts and Heritage Research Council, that compares and contrasts heritage practices across a variety of different domains.

Since 2016 the two projects have been collaborating on Orford Ness, a salt marsh and shingle spit on England's Suffolk coast. Now owned by the National Trust and a National Nature Reserve, Site of Special Scientific Interest and protected wetland site, Orford Ness was formerly owned by the Ministry of Defence and home to several secretive experimental radar and weapons development programmes.

Formal collaboration between CITiZAN, Heritage Futures and the National Trust on Orford Ness has brought benefits to all involved. Through observing, working with and interviewing CITiZAN participants Heritage Futures has gained a deeper understanding of the motivations of archaeologists, both professional and volunteer. The wider scope of Heritage Futures provides CITiZAN with an opportunity to address broader questions surrounding the value that places hold for people, the ways in which humans and non-humans interact in the present and how and why we save things for the future. Working with the National Trust in such an ecologically sensitive area has likewise highlighted the dynamics of managing landscapes that are significant for both natural and human made environments.

This paper will explore the benefits and challenges of transdisciplinary work on Orford Ness, and will also touch on another collaboration in development there, in the form of work with local artist Debra Shipley.

07 THE EGTVED GIRL'S TALE – A PERSONAL NARRATIVE TO A DISTANT PAST

Author(s): Felding, Louise (VejleMuseum; Aarhus University)

Presentation Format: Oral

VejleMuseum are working towards creating a new visitor centre by a Bronze Age burial ground – 'The Egtved Girls Grave'. The aim with the new visitor centre is to tell the story of the Egtved Girl and bring presence to a distant past through a personal narrative. The experience will reflect a connection with history both through mind and body. Curiosity, interactivity and learning through play are key factors for the visitor experience at the site.

The on-going work is presented as a case for a transdisciplinary approach to public archaeology, which has successfully, engaged the local community by creating a sense of ownership to the site. Further, ongoing research will provide new insight into the role of the Egtved Girl in Bronze Age society. VejleMuseum are actively taking part in research collaborations with the National Museum of Denmark and Aarhus University to provide an up-to-date academically founded visitor experience.

The Egtved Girl's Grave has a strong local focus and attention and VejleMuseum has throughout the process involved the local community in the future plans for the site.

The work is presented as an example of a project where research and dissemination are in balance and the outcome is greater than

the sum of its parts.

08 CREATIVE INTERVENTIONS IN ARCHAEOLOGY: EXPERIMENTS IN FACILITATING COLLABORATION BETWEEN ARTISTS AND ARCHAEOLOGISTS

Author(s): Hannis, Jodie (University of Leicester)

Presentation Format: Oral

This paper addresses the potential for collaborative approaches to archaeological projects between artistic and creative practitioners and those working professionally in archaeology and heritage. Much of the discourse around encouraging public-focused or community archaeology revolves around valuing varying degrees of community involvement and reflecting on the uses and benefits of collaborative approaches for professionals and non-professionals alike. The research undertaken as part of the author's current PhD project seeks to focus on one particular type of 'community' - that of artists and creative practitioners in the UK who have or would be willing to work closely with heritage professionals. There is certainly no dearth of creative archaeological projects that have been successful in rendering archaeological theory and practice accessible, inspiring and inclusionary; this paper will review such existing projects and suggest some next steps forward based on critical evaluation and examples from the author's own ongoing collaborative projects. The aim is to reflect on the opportunities and difficulties that arise from working with this particular 'community' and most importantly, how such work can open new avenues of forming meaningful relationships with other groups who might typically be excluded from more mainstream heritage practices. With impact high on the agenda and many heritage professionals lacking formal public engagement or collaborative practice training and experience, a transdisciplinary approach provides an excellent opportunity to make the most of a range of skills and knowledge, and embed archaeology within wider cultural and social life.

09 OSLO MASONRY CITY: CREATING A TRULY TRANSDISCIPLINARY ARENA

Author(s): Kempton, Hanne (NIKU - Norwegian Institute for Cultural Heritage Research)

Presentation Format: Oral

This paper discusses how (heritage) practitioners can work together across subject boundaries and sectors to engage the public and increase a sense of public ownership of cultural heritage by using a truly transdisciplinary arena: Oslo Masonry City.

Oslo Masonry City was founded in 2017 as a non-profit organisation organizing events and services aimed at maintaining the classic tenement buildings in Oslo in a way that makes them last. Oslo grew significantly from 1850 to 1900 and the solution to the hordes of new inhabitants were tenement buildings. Oslo has one of the most intact areas of tenement houses in Europe from this period. These are listed buildings, but only a few areas are protected cultural environments. The continued care and maintenance is totally dependent on the continued appreciation and care by the people of Oslo: the owners, contractors, politicians and craftspeople.

Through different means Oslo Masonry City try to create pride, ownership and enthusiasm amongst the owners of these houses, and through this generate awareness that to maintain this heritage, one needs to use the right type of materials and methods, and not uncritically use standards developed for modern housing. The project also aims at creating a market for the traditional masonry crafts, like many other crafts, the bricklaying (mason) trade is experiencing a serious decline in applicants to vocational schools and apprenticeship in Norway. The work on the masonry tenements is often carried out by untrained people and the competition has become so hard that even the serious companies sometimes do second grade jobs.

For this project to become successful it will not be possible to remain within our own disciplinary boundaries. Translation of expertise is crucial, and communication must be (at least) two-way. This paper will elaborate on our experiences with this so far.

10 FEEDBACK BETWEEN ACADEMIC AND COMMERCIAL ARCHAEOLOGY. RESEARCH AND PUBLIC ENGAGEMENT MODELS

Author(s): Sancho, Marta - Soler, Maria (Universitat de Barcelona; Institut de Recerca en Cultures Medievales) - Alegría, Walter (Walvia)

Presentation Format: Oral

For a long period, commercial archaeology in Catalonia has developed separately and independently of academic archaeology, practiced by scientific institutions and universities. Academic research projects, receiving public funding, have traditionally featured research objectives away from the principles of urgency, speed and efficiency with which the work of commercial archaeology has been carried out.

Aware of the need for these two spheres to abandon their disconnection and to come together in a way capable of taking advantage of the best of each area, we want to share our experiences developed at some medieval archaeological sites in Catalonia. These efforts integrated the research principles of academic archaeology and the premises characterising the practice of commercial archaeology, in a framework of intense collaboration with public administrations, especially city councils, with collaboration agreements allowing us to fuse the two ways of working.

Contact with local councils not only provides necessary forms of financing, but also makes possible the development of numerous "public engagement" strategies, which affect both the transfer of knowledge and public participation. This allows us to carry out patrimonial actions that are more inclusive, collaborative, integrated and interdisciplinary, with a capacity not only to reach all kinds of citizens, but also so that they can contribute new elements to the discourse. The digital environment and social networks have been valuable resources to achieve this, along with archaeological practices that are more open to technical innovations, interdisci-

plinary collaboration, and professional experience.

11 FULFILLING OBJECTIVE (A): EASIER SAID THAN DONE?

Author(s): Oldham, Mark (NIKU - Norwegian Institute for Cultural Heritage Research)

Presentation Format: Oral

Objective (a) of the European Year of Cultural Heritage is to “encourage approaches to cultural heritage that are people-centred, inclusive, forward-looking, more integrated, sustainable and cross-sectoral”. One can argue that this is a positive vision, and in line with how many of us would like to see archaeology develop. But how achievable is this? Some would argue that archaeology is object-centred, exclusive, backward-looking, disjointed, unsustainable and sector-specific. Can we shift a whole discipline in one year or will it take many small steps of continuous improvement? Is this something we can achieve alone, or do we need help from colleagues in neighbouring fields?

In this paper, I want to explore how we can effect change through collaboration with other disciplines and, especially, look at how our interaction with the public can draw upon the experiences of other fields within heritage. I want to frame this by using a case study from a NIKU project – the Follo Line Project’s Pop-Up museum. At the time of submitting the abstract, the Pop-Up museum exists as just a good idea aiming to fulfil Objective (a) by being collaborative, inclusive and people-centred. What its status will be in September is thus unclear; how successful has the project been? How did it fare in being people-centred, inclusive, forward-looking, more integrated, sustainable and cross-sectoral?

12 “ONCE UPON A TIME AGO” - AN INTERDISCIPLINARY COLLABORATION BETWEEN ARCHAEOLOGY, MUSEOLOGY AND PEDAGOGY

Author(s): Toftdal, Mia - Kirk, Sidsel (Museum of Copenhagen) - Pécseli, Benedicta (University Collage Capital)

Presentation Format: Oral

In October 2017 the Museum of Copenhagen opened its doors to the new Archaeological Workshop, - the location where all the archaeological finds are processed, and which aims via inclusive, authentic, participatory and people-centered outreach to increase the access to archaeological material and hence our common cultural heritage. Reaching out not only to the citizens of Copenhagen, as well as tourists, students and other visitors, a key audience for the Archaeological Workshop is kindergarten children.

A partnership between the Museum of Copenhagen and the University College Capital has investigated the potential of incorporating archaeology into pedagogical student practices in kindergartens. Through an interdisciplinary collaboration between archaeology, museology and pedagogy, the project has provided new knowledge as to how encounters between young children and archaeology can contribute to the development of learning abilities and general formation of the children. Archaeological finds have an instant fascination and a great strength in that they are physically available due to their materiality. The project “Once upon a time ago” has shown new ways of addressing the access to cultural heritage and history to young children aged 2 to 5, and it has exposed the great potential of not only learning about archaeology, but learning through archaeology.

13 CULTURAL-EXPERIENCES FOR AND WITH CITIZENS - ESCAPE AND ‘REBUILDING THE ABBEY’

Author(s): Møllerup, Lene - Høst-Madsen, Lene (Museum Skanderborg) - Bangsbo Dissing, Nina (Skanderborg Kommune) - Purup, Marianne (Visit Skanderborg)

Presentation Format: Oral

For four years, the Danish concept eScape has worked with the dissemination of cultural heritage in an inclusive way by engaging the public and working across professional boundaries. Behind the concept are partners, one does not usually see collaborate to create cultural experiences for and with citizens.

eScape is a collaboration between Museum Skanderborg, Skanderborg Art Council, Visit Skanderborg and Skanderborg Local Council, Denmark. The cooperation works because there is mutual respect between the respective partners and their different professions.

The main purpose is to create cultural heritage experiences in places where archaeological excavations have revealed important findings. The art acts as a mediator for the process. Through its visual means, the art can act as intermediary link between the present and the past. In this way, the nature and spirit of the place are made available in a new and different way.

eScape views cultural heritage as a resource and by involving locals and guests, ownership and commitment to the cultural heritage associated with the site is created. In this way, value for the surrounding community is generated for both landowners, locals and tourists.

This presentation will provide an example of how cross-border collaboration can engage the public and create ownership for a common cultural heritage. The case presented is the eScape event ‘Rebuilding the Abbey’, which took place in May 2017, where the French artist Olivier Grossetête together with several thousand volunteers created a 17 meter high sculpture of cardboard.

Theme: Archaeology and the future of cities and urban landscapes

Organisers: Devos, Yannick (CRéA-Patrimoine, Université Libre de Bruxelles) - Wouters, Barbora (Aarhus University; Vrije Universiteit Brussel) - Banerjee, Rowena (University of Reading) - Borderie, Quentin (Département de l'Eure-et-Loir) - Nicosia, Cristiano (University of Padova)

Format: Regular session

Urban contexts are integral to understanding the big issues that archaeology seeks to address, such as the emergence of societies, the co-existence of communities, market systems, and societal collapse. Geoarchaeology, the application of earth science methods and concepts (geomorphology, geology, pedology, etc.), enables these issues to be examined using multi-scalar approaches, ranging from the geomorphological study of the town and its surroundings to the micromorphological study of individual stratigraphic units. Geoarchaeology has shown to be particularly rewarding for addressing the study of site stratigraphy, a key challenge in urban archaeology, with urban deposits often reaching several metres in thickness.

This session aims to address a series of current issues within the broad developing field of urban geoarchaeology. We particularly welcome contributions that focus on the impact of urbanisation on soils; the use and organisation of urban space; urban stratigraphy and Dark Earth; ancient soil pollution in towns; reconstructions of the physical (geomorphological) environment and the interactions of towns within their wider regions.

ABSTRACTS

01 INTRODUCTION

Author(s): Devos, Yannick (Université Libre de Bruxelles) - Wouters, Barbora (Vrije Universiteit Brussel; Aarhus University) - Banerjee, Rowena (University of Reading) - Borderie, Quentin (Département de l'Eure-et-Loir) - Nicosia, Cristiano (University of Padova)

Presentation Format: Oral

Geoarchaeological research, the application of earth science methods and concepts (geomorphology, geology, pedology, soil chemistry, mineralogy, etc.) in urban contexts has experienced an important development over the last decades. Especially the UK, France and Italy have longstanding traditions, but urban geoarchaeology has more recently also successfully been introduced in for example Belgium and the Baltic states, for example. In this introductory talk we intend to give a brief state of the art of urban geoarchaeology in different parts of Europe. We will touch upon the many different methods that have been employed, the need for multiscale approaches ranging from the geomorphological study of the town and its surroundings to the micromorphological study of individual stratigraphic units, and how geoarchaeological research is integrated in the broader archaeological framework. We will further address a series of current topics, such as the impact of urbanization on soils; the use and organisation of urban space; urban stratigraphy and Dark Earth; ancient soil pollution in towns; reconstructions of the physical (geomorphological) environment, integrated environmental research involving close interaction with archaeobotanists and archaeozoologist, for instance, and the interactions of towns within their wider regions. Finally, we will discuss some of the challenges faced by geoarchaeological research in urban contexts.

02 FROM SETTLED VILLAGES TO MEGA-SITES: A GEOARCHAEOLOGICAL APPROACH TOWARDS UNDERSTANDING THE DEVELOPMENT OF EARLY URBANISM IN CENTRAL ANATOLIA

Author(s): Garcia-Suarez, Aroa (University of Reading)

Presentation Format: Oral

The development of sedentism, increasingly complex social practices, and ecological strategies reliant on agriculture and animal husbandry during the Near Eastern Neolithic, resulted in the emergence of early urban sites in this part of the world. The so-called 'mega-site' of Çatalhöyük (7100 – 5900 cal BC) in Central Anatolia, extending over 13 hectares and with an estimated maximum population of 8000 inhabitants, displays a continuous occupation sequence of approximately 10 metres in depth, reminiscent of urban contexts in modern cities.

The large agglomeration at Çatalhöyük represents the climax of a process of increasing settlement size that originated with smaller settled communities in the Konya Plain. Excavations at the early agricultural settlement of Boncuklu (ca. 8500-7500 BC), situated 9.5km from Çatalhöyük and likely an immediate predecessor of this larger site, have shed light into the transition from village to urban spaces.

This paper examines uses and organisation of space at these two sites through the micromorphological analysis of stratigraphic sequences in buildings and open areas, key to understanding what constitutes urban space and how it develops. Comparative results point towards a similar treatment of space inside structures, manifested in clearly demarcated 'clean' and 'dirty' areas. However, differences in midden formation processes between these two settlements indicate distinctive concepts of discard and spatial organisation in open areas, possibly related to the performance of communal activities.

03 SABRATHA: THE PUNIC EMPORIUM. NEW DATA AND PROSPECTS FOR TOPOGRAPHIC AND TOWN PLANNING RESEARCH

Author(s): Mistretta, Alessia (University of Geneva)

Presentation Format: Oral

The ancient city of Sabratha (Libya) rises on a vast trapezium-shaped piece of land covering an area of just under 500,000 square metres (corresponding to the area of the excavations) between the Mediterranean Sea to the north and the rich and verdant Gefara to the south. This is the point where just before the end of the fifth century B.C. Punic traders landed and set up their emporium in the area that was later to be used for the Forum. As testified by the remains today, in the following two centuries the city spread south of the Antonine Temple. In epigraphic inscriptions and later sources, Sabratha is the correct form that is always used. The Phoenician emporium was laid out on an irregular plan, which has survived, despite Roman rebuilding of Regio II north-east of the Forum. The development of the new urban district began in the second half of the second in what was later to become Regio VI, where there was a dense agglomerate of Punic dwellings, plus the two famous mausolea. At the turn of the century and until the end of the first century B.C., the tofet in honour of Tanit and Ba'al Hammon – located at the western tip of the city – assumed great importance. Development of the Roman city began in the last decades of the first century B.C. after the end of the reign of Numidia when Sabratha, in 46 B.C., became part of the Roman province of Africa.

04 URBAN DEVELOPMENT IN FRONTIER ZONES: A GEOARCHAEOLOGY OF REGIME CHANGE

Author(s): Banerjee, Rowena (University of Reading)

Presentation Format: Oral

What are the catalysts for urban development? Frontiers, the spaces across borders, are dynamic zones of mobility and acculturation. How do cities develop in unstable frontier landscapes? To what extent is the structuring and range of commercial, domestic, and religious activities an expression of a controlled process of urbanisation?

This paper addresses these questions by examining the geoarchaeological data in two urban case studies: one Roman and one medieval, but both with Iron Age origins. The first case study is Silchester (Hampshire, UK), the site of the Roman regional centre or civitas capital of Calleva Atrebatum. It is arguably a frontier town at its beginning and its end: during the Roman conquest of Britain, and in the early medieval period where the town lies at the eastern end of the Wandsdyke frontier system. The second case study is Riga, the modern capital of Latvia, the establishment of which is synonymous with the Livonian Crusade (1198-1291). The Late Iron Age of the central Riga district is relatively well known, consisting of two settlements and cemeteries. One of the Late Iron Age settlements, the 'Liv' village, became incorporated into the medieval town when it was founded in 1201, and the excavations are examined in this paper.

The geoarchaeological data from internal spaces at these two urban case studies are examined spatially and chronologically to examine, at high resolution, the extent to which the inhabitants' lives changed as a result of political change. Geoarchaeology has been instrumental in demonstrating resistance to change and the retention of traditions in terms of the organisation of urban space and activities.

05 UNDER THE WAVES. GEOARCHAEOLOGY OF THE TSUNAMI THAT DESTROYED THE FLUVIAL PORT OF ROMAN HISPALIS (SEVILLA, SPAIN)

Author(s): Gutiérrez-Rodríguez, Mario (Universidad de Granada)

Presentation Format: Oral

In recent years there has been an exponential increase in the archaeological knowledge of the Colonia Iulia Romula Hispalis, the city of Seville in Roman times. The excavations carried out in the current Patio de Banderas, in the Reales Alcázares have provided very significant data. In this space it has been identified the fluvial port of the city. Specifically, a large commercial storage building, an horreum linked to the statal trading of the annona. This structural complex was destroyed by an Extreme Wave Event at the end of the II century d.C. A high resolution geoarchaeological study has been carried out in order to identify the site formation processes involved in the genesis of the archaeological record. This study is based on the development of a multi-proxy research strategy that combines different methodologies of Earth Sciences, such as soil and sediment micromorphology, mineralogy and geochemistry. The analysis of microfacies allowed us to characterize the different stages of sedimentation of this high energy event, as well as to characterize the origin of exogenous sedimentary components and, finally, to evaluate the impact that this event had on the urban fabric of the city. Microfacies analysis Our study explores the following questions: What was the sedimentological evidence left by the tsunami responsible for the destruction of this building? Did this high energy event affect the rest of the coastal cities of the Iberian Peninsula?

06 URBAN GEOARCHAEOLOGY IN BELGIUM: CURRENT DEVELOPMENTS AND FUTURE PERSPECTIVES

Author(s): Devos, Yannick (CRéA-Patrimoine, Université Libre de Bruxelles; Vrije Universiteit Brussel) - Wouters, Barbara (Centre for Urban Network Evolutions - UrbNet, Aarhus University; Vrije Universiteit Brussel)

Presentation Format: Oral

Geoarchaeological research in urban contexts is a fairly recent development in Belgium, with pioneering studies in Brussels and

Flanders dating back to the 1990s. In the beginning of the 21st century, a specific research protocol has been developed in Brussels (Devos et al., 2009; 2011). This approach has recently been applied on a series of urban sites in Flanders and Wallonia (Devos et al., 2013, Wouters et al., 2017).

This contribution will discuss some of the current debates, focussing on:

- The impact of urbanisation on the soil
- Dark Earth and microstratigraphy
- Ancient pollution and waste management
- Reconstruction of the ancient relief and its modifications through time
- Integration of geoarchaeology and other archaeoenvironmental studies (archaeobotany, zooarchaeology,...)

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07 TOWNS ON THE EDGE: URBAN GEOARCHAEOLOGY OF MEDIEVAL IEPER (COLAERTPLEIN)

Author(s): Wouters, Barbora (UrbNet, Aarhus University; Vrije Universiteit Brussel) - Devos, Yannick (CreA, Université Libre de Bruxelles; Vrije Universiteit Brussel) - Bartholomieux, Bart - Bradt, Tomas (Monument Vandekerckhove nv)

Presentation Format: Oral

Medieval towns in the Low Countries are counted among the best known of their kind. However, geoarchaeological research has remained relatively scarce, and only in the past decade have such studies started to increase (see for instance Lier, Aalst, Antwerpen). At the same time, geoarchaeology is exceptionally well suited to the study of these complex stratigraphical deposits, which oftentimes present difficulties for field archaeologists. Additionally, important historical questions such as market formation, spatial differentiation, or the role and character of agriculture and the keeping of animals in towns to name but a few, currently remain understudied. Thanks to commercial excavations, previously less focused-on areas of Flemish towns are being subjected to archaeological investigation, as was the case in Ieper.

In 2014, two zones on the edge of the town of Ieper, just within the medieval town rampart, were excavated by Monument Vandekerckhove. This presented a unique opportunity to assess the activities that took place here. Located at the west of the town, one of the zones lay close to a gate in the town rampart. The differences between the two zones, while located in relative vicinity to each other, were striking. While both areas contained a homogeneous "dark earth" likely representing agricultural activities, the southern zone was covered by walking surfaces and house floors dating from at least the twelfth century onwards. The zone close to the gate, on the other hand, may have been used as an animal pen after which it became characterized by gradual accumulations of waste, potentially reminiscent of a street market. It remained a wet and open zone. This study documents a poorly known phase in the town's evolution and will ideally be compared with what was happening in the centre of town, as well as with other edges of towns from the same period.

08 HORTICULTURE IN A SUBURB OF MEDIEVAL AND MODERN-ERA WROCŁAW (POLAND) AND FORMATION OF DARK EARTH

Author(s): Krupski, Mateusz (Archeolodzy.org Foundation; Institute of Archaeology, University of Wrocław) - Kabała, Cezary (Institute of Soil Science and Environmental Protection, Wrocław University of Environmental and Life Sciences) - Sady, Agata (Archaeology Department, Silesian Museum) - Gliński, Radosław (Institute of Art History, University of Wrocław) - Wojcieszak, Jacek (Sigillum Pracownia Archeologiczna)

Presentation Format: Oral

The history of development of cities is recorded in archaeological stratification. Imagining the unimaginable number of factors that potentially have contributed to the formation of urban strata over periods of hundreds of years, it seems only natural that a multi-aspect methodology is needed to access this archive and discover past land use. Geoarchaeological approaches prove useful in this matter, allowing to uncover often complex formation histories of layers/horizons, in which natural factors and anthropogenic activity go hand-in-hand. The identification of certain episodes (occupation, cultivation, animal management, pedogenesis, etc.), which happened in the past in different areas of cities, reveals the history of urban landscapes in great detail.

During archaeological fieldwork a Dark Earth-like horizon was discovered in Wrocław (SW Poland). It was situated on natural alluvial sand and sealed by late 19th century deposits. Other macroscopic properties included unusual thickness of up to 0,60 m, homogeneity, high humus content and dark colour, as well as a surprising scarcity of anthropogenic inclusions. Considering the site's

location and history, three hypotheses regarding the formation of this unit were examined: pedogenesis in alluvial material, human activity resulting in accumulation of occupation related materials and agricultural/horticultural activities. A combination of detailed archival queries and results of micromorphological, physico-chemical and archaeobotanical analyses, pointed towards the latter possibility. It seems that the horizon was formed intentionally, by application of double- and triple-digging. These labour intensive practices modified the original soil, increasing the thickness of the A-horizon to make it suitable for supporting gardens and orchards. The occurrence of similarly created buried Dark Earths/Rigosols – relics of specific land use, may be one of the characteristics of once-suburban/hinterland areas of European cities.

09 GEOARCHAEOLOGY OF THE EARLY MIDDLE AGE TOWN OF SAINT-DENIS, FRANCE

Author(s): Borderie, Quentin (CNRS UMR 7041-ArScAn)

Presentation Format: Oral

Located 10km in the North of Paris, the town of Saint-Denis has been developed since the early Middle Age on a complex geomorphological context dominated by alluvial deposits and hydrological systems. The former is composed by tertiary marls and quaternary loess and alluvium, forming 2 to 5m high hills above the river Seine. The town grows on the top of one of them. The latter is composed by the hydrosystems of different small tributaries of the Seine, which lies 1,2km westward. Until now, this substratum, and the pedo-sedimentary formation on which the town takes place, were poorly documented.

The development of the town starts around the 10th c., in the surroundings of the rural basilica dedicated to Saint-Denis. The artificialisation of the hydrosystem has been documented by archaeological investigations since the 1970's. Today, the main lines of the modification of the topography and of the water flows are quite well understood.

Recently, geoarchaeological investigations have better documented the substratum and the pedo-sedimentary environment. Moreover, they allow to precise the relations between the urban activities, the development of the town and the artificialisation of the environment. Micromorphological analyses of waterlogged strata help identifying the urban activities, which used the hydrosystem and contributed to the filling of the channels and their abandonment. Moreover, specific activities and medieval indoor contexts have been sampled and characterised.

a. ENVIRONMENTAL CHANGES IN A MOROCCAN RIVER: LANDSCAPE AND HISTORICAL OCCUPATION AT OUED KSAR SEGHIR

Author(s): Costa, Ana Maria (Archaeosciences Laboratory - LARC - of the Directorate General for Cultural Heritage - DGPC, Lisbon; Research Centre for Biodiversity and Genetic Resources - CIBIO/InBIO; Instituto Dom Luiz - IDL, Lisbon University; IIIIPC, Cantabria University) - Freitas, Maria Conceição - Costa, Pedro (Instituto Dom Luiz - IDL, Lisbon University; Geology Department, Faculty of Sciences, Lisbon University) - Teixeira, André (CHAM, FCSH, Universidade NOVA de Lisboa; Departamento de História, FCSH, Universidade NOVA de Lisboa) - Lopes, Vera (Geology Department, Faculty of Sciences, Lisbon University) - Duarte, João - Rodrigues, Aurora (Hydrographic Institute - IH, Lisbon) - Carvalho, Helena (Lab2PT e Instituto de Ciências Sociais, Universidade do Minho) - El-Boudjay, Abdelatif (Conservation du Site Archéologique de Ksar Seghir, Direction Régionale de Culture Tanger - Tétouan - El Hoceima) - Lopes, Gonçalo (CHAM, FCSH, Universidade NOVA de Lisboa)

Presentation Format: Poster

Oued Ksar Seghir is a small river running S-N and outleting in the Strait of Gibraltar, between Tangier and Ceuta. During the medieval period small villages were established throughout the river valley. The town of Ksar Seghir was founded on the right river margin, surrounded by river and sea and used as a shipyard for Moroccan dynasties. In the 15th and 16th centuries, Portugal occupied Ksar Seghir to control the Strait and increase its power in North Africa. In order to develop maritime activities, several structures were built between the fortress and the sea spread over a significant area of the river margins. Subsequent alterations on these structures suggest changes on the surroundings, such as beach accretion.

The aim of this work is to establish the environmental evolution of Oued Ksar Seghir applying multiproxy analyses on sediment cores collected in the present-day alluvial plain, and comprehend the relationship between landscape and human occupation and related archaeological findings.

KS1 is a sediment core collected on the right margin of Oued Ksar Seghir, close to the west gate of the Portuguese fortress. Macroscopic description revealed intercalations of fine sand and mud within the sedimentary column. X-Ray photographs of the core revealed sedimentary structures (e.g. flame structures, load casts) that could be related with specific sedimentary dynamics/processes. High-resolution magnetic susceptibility will be correlated with XRF analyses to determine the elemental composition and provenance of the material. The overall chronology and sedimentation rates will be achieved using ¹⁴C dating. Other environmental proxies (e.g. grain-size, organic chemistry) will help to characterize the sediment and ascertain its provenance.

Despite the early stage of this study, the promising results will contribute to a detailed knowledge of Oued al-Qsar environmental evolution and will allow developing an accurate model of the setting of this area during historical times.

APPROACHES TO MEDIEVAL BUILDINGS: THE PAST, PRESENT, AND FUTURE OF INTERPRETATION AND MANAGEMENT

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Huggon, Martin (Bishop Grosseteste University, Lincoln) - Kerr, Sarah (Trinity College Dublin) - Berryman, Duncan (Queen's University, Belfast) - Bouwmeester, Jeroen (Cultural Heritage Agency, the Netherlands)

Format: Regular session

Buildings serve to structure experiences and connections, from the functional requirements of living to more ephemeral social practices. They are both a material object and a container for such objects, just as they can be both a symbolic entity and a container for them. By understanding the development, use, and reuse of buildings, construction techniques, or building traditions throughout the medieval period there is the opportunity to highlight the multi-faceted role these structures carried out in the past.

However these structures do not just hold this multi-faceted role in the past, but they continue to act upon the world in the present, helping to structure our approaches to tourism, heritage, and conservation in the future. The manner in which medieval buildings are valued, protected, and interpreted to the public is tied intimately to the more traditional scholarship which aims to understand these sites in the past. It is hoped that by bringing these elements together a vibrant discussion on the importance and role of medieval buildings in the past, the present, and the future can be elicited.

This session aims to include a mix of papers and topics, including more traditional buildings studies, archaeological syntheses of traditions or types, the nature of buildings in their landscape, conservation, heritage management, and the role of buildings in policy, but we also welcome those that look more broadly or that cross and join topics.

ABSTRACTS

01 APPROACHES TO MEDIEVAL BUILDINGS: THE PAST, PRESENT, AND FUTURE OF INTERPRETATION AND MANAGEMENT

Author(s): Huggon, Martin (Bishop Grosseteste University, Lincoln; University of Sheffield)

Presentation Format: Oral

An introduction to the session. Buildings serve to structure experiences and connections, from the functional requirements of living to more ephemeral social practices. They are both a material object and a container for such objects, just as they can be both a symbolic entity and a container for them. By understanding the development, use, and reuse of buildings, construction techniques, or building traditions throughout the medieval period there is the opportunity to highlight the multi-faceted role these structures carried out in the past.

However these structures did not just hold this multi-faceted role in the past, but they continue to act upon the world in the present, and they help to structure our approaches to tourism, heritage, and conservation in the future. The manner in which medieval buildings are valued, protected, and interpreted to the public is tied intimately to the more traditional scholarship which aims to understand these sites in the past. It is hoped that by bringing these elements together a vibrant discussion on the importance and role of medieval buildings in the past, the present, and the future can be elicited.

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02 WHO SETS THE AGENDA? MEDIEVAL BUILDINGS IN RESEARCH, HERITAGE MANAGEMENT AND AS PRESENTATIONS OF THE PAST AT PRESENT

Author(s): Seppanen, Liisa (University of Turku)

Presentation Format: Oral

Though physically concrete, visible and easily detectable, buildings compose one of the most abstract fields of study and complex source material for archaeologists. We are not only documenting and analysing the material evidence of the remains, but create interpretations about the buildings and built space as they once were and about the meanings, functions and activities they contained. By looking beyond the physical design we try to capture the dynamic interactions that once existed between people and environment (including built and natural environment) within the social context at that time. Buildings carry evidence of traditions, cultural connections, adoption and assimilation of ideas and innovations, social ambition, exploitation of environment as well as transformation of the society and living conditions. Furthermore, the buildings have an important role in cultural management as objects of preservation, conservation and presentation as well as in creating images and providing experiences for the public.

In this paper, I give an overview to the studies related to medieval buildings in Finland and discuss the values and practises related to the protection, research, preservation, use and display of the buildings in heritage management. In Finland, the number of still standing medieval buildings is limited consisting mainly of churches and castles. Therefore, the discussion includes also remains

underground as archaeological heritage and research potential.

With some examples I am reflecting the following questions: Are there differences in approaches, what kind of and why? Does heritage management define the scope of study related to the buildings – if so, on what terms and in which way? Are we able to analyse the buildings as multifaceted manifestations of the past and transmit the knowledge related to the buildings to the people? Who sets the agenda for studies related to the buildings as well as for the dissemination of information?

03 VERNACULAR ARCHITECTURE AND ARCHAEOLOGY: PROPOSALS FOR RESEARCH AND ITS PRESERVATION

Author(s): Rodríguez-Pérez, Santiago - López-Gómez, Pablo (Llabor - Laboratorio rural de historia, paisaje y patrimonio)

Presentation Format: Oral

The vernacular architecture constitutes a very wide and diverse material record, reflection of the relationship between the human groups and an area; the collective management of the resources and the construction of habitats over time based on material, social, economic and cultural factors.

This communication aims to present a reflection on the challenges found in the study of vernacular architecture from the field of Archaeology, as well as the possibilities that are yet to be explored in this field of study in Spain. A heritage currently at serious risk of disappearing, which is why, besides its research and documentation, the awareness-raising and involvement of local communities in the preservation, management and utilization of their own heritage is considered as vital.

In order to do so, the preliminary results of the research project developed over the past few years about the vernacular architecture of the region of the Navia river valley (Asturias, Spain) are taken as a starting point. Its ultimate goal on a long term basis is the development of an interdisciplinary study of the historic evolution of a rural region's landscape, from the Middle Ages to modern times, emphasizing the study of its material culture and architectural record. To this end, the localisation and inventory of all the preserved buildings in a specific area is proposed, as well as its photographic documentation and survey (3D); the data integration from the documentary sources, both written and oral; the profiling of this buildings (architectural typologies, building techniques, etc.); its archaeological study (wall panels analysis, dating, building phases and typologies, etc.); the interpretation and analysis of its cultural, geographic, economic and social context and, finally, the formulation of proposals for its preservation.

04 BUILDING ARCHAEOLOGY TO IMPROVE THE INTERPRETATION AND MANAGEMENT OF THE FORTIFIED COMPLEX OF MOLINA DE ARAGÓN (GUADALAJARA)

Author(s): Montero, Andrea (University of Jaén) - Martínez, Cristina - García-Contreras, Guillermo (University of Granada)

Presentation Format: Oral

The fortified town of Molina de Aragón is located in the current province of Guadalajara, in the center of the Iberian Peninsula. Its physiognomy is the result of a convulsive middle Ages in which the frontier between Muslims and Christians first (al-Andalus vs the Feudal Kingdoms), and between Christian kingdoms secondly (Castile vs Aragon) has left a material footprint at both, the urban and environmental level. MAM project (Molina: Arquitectura Medieval) aims to contribute to the knowledge of medieval architecture from archaeological, stratigraphic analysis of construction techniques and characterization of typologies that can be documented in the main fortification of the town. In addition, a multidisciplinary vision is adopted in which all sources of information available are taken into account (written sources, historical cartography, surface or geophysical surveys, archaeological excavations, geoarchaeological studies etc.). The work not only points towards a better knowledge of the fortified complex, but also to its relation with other surrounded sites by comparing constructive techniques used and possible crossed chronologies that can explain the dynamics of creation and transformation of the medieval landscapes. Moreover, in addition to the creation of historical knowledge, one of the most important point of this small project is try to create tools that improve the management of the sites to both, the City Council and the local museum. In order to achieve this objective, the project incorporates simplified files prepared to serve as interpretation, management and dissemination instruments, eventually used as material for tourism purpose, but at the same time to continue collecting information on the set in the futures.

05 THE CASTLE OF MONTSORIU, A CASE OF SUCCESS IN THE RECOVERY OF MEDIEVAL HERITAGE.

Author(s): Tura, Jordi - Pujadas, Sandra - Mateu, Joaquim (Museu Etnològic del Montseny) - Llorens, Josep M. (Museu d'Arqueologia de Catalunya - Girona) - Font, Gemma (Museu Etnològic del Montseny)

Presentation Format: Oral

The ruins of Montsoriu aroused the interest of literates, historians, and hikers since the 19th century. In 1914 the Mancomunitat de Catalunya elaborated the first sketch of a restoration project, but it wasn't until mid-20th century that the institutions attempt to give value to the ruins of an emblematic castle (City Council of Arbúcies, 1949) and a first archaeological study (1952, Institut d'Estudis Gironins). None of these initiatives paid off and efforts to recover did not resume until the 1980s, within the framework of the first archaeological excavation campaign.

The Ethnological Museum of Montseny led the popular campaign to safeguard the monument (1991) and drafted the statutes of the Association of Friends of the Castle of Montsoriu (1993). At the same time, they began scientific works on a global archaeological and historical project and architectural recovery.

In these last 25 years, Montsoriu has changed its appearance due to the development the restoration and consolidation works (Board of trustees of the castle, 1991) framed within the Architecture Master Plan (2004), which establishes the guidelines for future intervention, the landscape and volumetric profile is regulated, and aspects of the planned restraints are specified. The various phases of architectural restoration are developed in parallel to archaeological works and which allowed the opening of the monument to the public since 2011.

At the moment Montsoriu (www.montsoriu.cat) is considered an example of successful heritage management. Restoration works continues and are combined with guided and free visits and receives about 16,000 visitors per year.

The immediate future of Montsoriu passes through the completion of the restoration project and its main role in the definition of a tourist-cultural product in a region of more than 160,000 people with an important tourist tradition, especially in the area of the Natural Park of Montseny.

06 TOURISM DRIVEN CONSERVATION IN NORTHERN IRELAND: BUT IS EVERYONE ON BOARD?

Author(s): Patrick, Laura (Queen's University Belfast)

Presentation Format: Oral

Today, the importance of historic buildings goes beyond academic interest and the avid curiosity of those who belong to heritage based societies. This is a trend that can be seen worldwide, but in the last decade has increased tenfold in Northern Ireland. Buildings that once lay dormant, and only induced compassion from conservationists are now being transformed into hotels, tourist attractions and film sets. But how has this impacted their level of protection, interpretation and conservation for future use, and it is practiced universally?

This paper looks at a number of case studies from across Northern Ireland to address these questions. In some instances, millions are being invested by funders and local councils to raise the awareness of historic buildings and aid in their conservation. Their goal being to present the tourist with a heritage rich town, and encourage dwell time within the historic town centres. But are the local building owners buying into these townscape schemes?

On the other hand, in rural areas, where enforcement and investment is significant lower, some land owners have caused major destruction to the built heritage under their care. Restrictions on accessing the land prevent archaeologists investigating what remains, before all is lost. This raises the question, how can we encourage the preservation of our built heritage for perpetuity?

Ultimately conservation cannot be supported in the long term without the support of the local population. But are the current efforts enough and what further can be done to improve levels of support?

07 I'M STILL STANDING AFTER ALL THIS TIME: THE SURVIVAL OF MEDIEVAL BARN TO THE PRESENT DAY

Author(s): Berryman, Duncan (Queen's University Belfast)

Presentation Format: Oral

When we look at medieval buildings, we often wonder 'Why were such splendid old houses built in this area and not in that?' (Currie 1988, 6). But this assumes that there is something special about these buildings. In his article on building survival, Currie goes on to ask 'Why has such dreadful old rubbish been demolished in that area but not this?', suggesting that what we see often survives because the owners could not afford to rebuild.

Medieval agricultural buildings rarely survive to the present day, the main exception is the barn. This paper will discuss why these buildings are the only remnants of the manorial curiae of which they were once a part. Barns of both timber and stone construction have survived as well as buildings of all sizes, thus it is possible to explore the reasons so many barns have continued to be used, been adapted for other purposes, or have been preserved. Recent research has shown that there were complex reasons for constructing new buildings in the fourteenth century, and these need to be understood to provide some context for the survival of medieval barns. This paper will also explore more recent attitudes to these buildings to explain why they were not replaced with more functional buildings or lost to time like many of their contemporaries.

Today, many of these barns are heritage attractions or have been converted into holiday homes. For many people, these buildings are the only way they will feel connected to the medieval peasantry and medieval agriculture. Therefore, it is important that we understand these buildings in the context of the curia and why they have survived, while all the 'rubbish' around them has been demolished.

08 TOWERS OF BURJASSÉNIA AND PRIOR: FROM TURRIS/MANSUM TO A PRIVATE HOUSE OR HOTEL

Author(s): Mateu, Marina - Closa, Ariadna (Universitat Autònoma de Barcelona)

Presentation Format: Oral

Tortosa, the main Muslim city of the Baix Ebre (Catalonia), was conquered in 1148 by the Catalan count Ramon Berenguer IV. Both the city and its hinterland were immediately settled by Christian colonists from the north, who substituted the native population that had fled or died during the invasion. This process of colonization entailed the appearance of new settlement patterns and the subsequent transformation of the landscape. The documents of 12th and 13th centuries show how the feudal nobility used the

towers as instruments of colonization. The towers of Burjassénia and Prior are two paradigmatic examples of physical conservation and documental record.

Thanks to the application of both the archaeology of architecture and the documentary research we have been able to determine the architectural and functional evolution of these fortifications through the time. Despite the difference of their floor plan, both towers are dated by the end of the twelfth century and they were constructed following the same architectural guidelines. Apart from its defensive role, which has always been remarked by traditional historiography, since their origins these towers were associated with agricultural landscapes and inhabited spaces. This clear bond established with the rural world is later deepened as they were described as farmhouses (*mansum*) in medieval documents, a structure that has been preserved until nowadays. However, both towers have grown to become either a hotel or being isolated in the middle of a private house's garden, such are the cases of the tower of Prior and the Burjássenia, respectively.

Their transformation in private residences has been a key factor to their preservation, but it is a double edged-sword since the restorations works were made without the guidance and control of the Servei d'Arqueologia de les Terres de l'Ebre. This has proven to be detrimental to their historical and archaeological value.

09 INTERDISCIPLINARY RESEARCH ON AN UNSUNG MATERIAL IN THE MEDIEVAL AND POST-MEDIEVAL ECONOMY: THE ROOFING PLANKS

Author(s): Labbas, Vincent (CNRS, LA3M UMR 7298 CNRS – Aix Marseille Université) - Burri, Sylvain (CNRS, TRACES UMR 5608 CNRS - Université Toulouse Jean Jaurès) - Bernardi, Philippe (CNRS, researcher, LAMOP UMR 8589 CNRS – Université Paris 1 Panthéon-Sorbonne)

Presentation Format: Oral

This speech deals with the history of the medieval and post-medieval building activity through an interdisciplinary research of a perishable and unsung material in south-eastern France: the roofing planks, locally known as « *échandoles* ». The joint-up approach of, on the one hand, the historical sources - mostly composed of notarial deeds and accounts and, on the other one, the archaeological and dendrochronological coming from mountain buildings - mainly mountain barns- provides new insights into the chronology of use of these items, the various manufacturing techniques, typologies and their place in the building economy.

At first, this study documents a long use chronology of *échandoles* since the 12th century. But this material, obviously standardized, shows typological changings. During the Middle Age, the *échandoles* are produced in mountain areas from larch (*Larix Decidua* Mill.). They were used as well in local building as sent and traded to the towns in lower Provence. The purchases agreements and the building contracts allow us to identify the areas of production and destination as well to know the plank price and their transportation cost. During the modern era, the production and the use of *échandoles* decreasing because of tiles competition, seem to be limited to the mountain area near the resources. The typological roofs analysis from the mountain buildings gives data on the material used and the frequency for overhauling and changing the roof planks. So, through the study of the *échandoles*, we can highlight an aspect of the medieval and post-medieval use of the forest resources.

The interdisciplinary dialogue demonstrates the permeability of mountain and urban areas, economically linked by the production of a characteristic material and specialized know-how.

10 UNDERSTANDING A BRICK AND STONE-BRICK BUILDINGS WITH APPLYING THERMOLUMINESCENCE AND OPTICALLY STIMULATED LUMINESCENCE DATING

Author(s): Ginter, Artur (Institute of Archaeology, University of Lodz)

Presentation Format: Oral

I'm going to show how on the basis of the analysis of bricks and artifacts made of burnt clay with the use of thermoluminescence (TL) and optically stimulated luminescence (OSL) dating method we can reveal the history of brick and stone-brick buildings and how these methods helps us to understand them (the development, construction techniques, building traditions etc.). These methods are especially useful in archaeology because they allow us to date objects made of clay and burnt in temperatures above 350°C such us bricks, ceramic pottery, stove tiles, roof tiles, floor tiles, burnt daub and many more. In other words, those are movable artifacts that are regarded to be materials of little chronological sensitivity, especially when they are heavily ground down and atypical.

I want to show the most significant dating results and based on it phases identifications include those concerning the castle in Siewierz, the Cistercian abbey complex in Sulejów, listed as a Monument of History. In Siewierz it was established beyond doubt that the first phase of settlement comprised the stronghold constructed in the early thirteenth century, and that the masonry tower of final defence was raised later in the same century, and not in the fourteenth century, as was earlier believed. Equally significant proved to be the results of TL dating carried out in Sulejów. It was possible to confirm the augmenting of fortifications in the early fifteenth century in the times of the abbot Salomon, and to determine the date for the construction and reconstruction of the old distillery, including functional identification.

We believed as dendrochronological dating revolutionized our knowledge about wooden architecture, so will luminescence dating enable us to ascertain in an ultimate way the chronology of many sites that until this day.

11 SPATIAL ANALYSIS OF THE LATE MEDIEVAL TOWER-HOUSES OF BRITAIN AND IRELAND

Author(s): O'Mahony, Michael (Queen's University Belfast)

Presentation Format: Oral

The tower-house represents the last major phase of castellated architecture in Late Medieval Britain and Ireland. They were constructed in great quantities between c.1300 to c.1600 in Britain and Ireland. Tower-houses are characterised as rectangular, multi-storeyed, stone-built keeps, often with ancillary buildings such as a banqueting hall and kitchen surrounding the tower-house.

The tower-houses of England have a predominantly northern concentration in Northumberland and Cumberland. They were constructed as residences for local lordships, and as a means of maintaining Border security. The tower-houses of Scotland have a much wider distribution than England, with nearly every Highland and Lowland Scottish clan constructing a tower-house throughout the Late Medieval period. There is a particularly heavy concentration in the Lowlands of Scotland, which stretches as far north as Aberdeenshire. Ireland is the most castellated country of the three, with the tower-houses being constructed by both the Gaelic-Irish and Anglo-Irish lordships. There is a particularly heavy cluster of tower-houses in SW Ireland, which is frontier territory between the Gaelic-Irish and Anglo-Irish.

The author's PhD research aims to provide the first analysis into tower-house structure and function across Britain and Ireland. A number of tower-houses from each of the three countries have been selected for interpretation. Spatial analysis will provide the principal methodology for examining the structure and organisational properties of the tower-houses, with a secondary architectural analysis examining diagnostic features which can determine room function. An additional analysis of the external structures around the tower will help determine if tower-houses are equally as complex across Britain and Ireland.

The following paper will highlight some of the key findings of the current author's research into the structural and functional properties of the tower-houses of Britain and Ireland. The results should give an insight into the role of the tower-house in British and Irish lordly society.

12 MEDIEVAL AND POST-MEDIEVAL CLERGY HOUSES IN FLANDERS, BUILD TO ORDER OR TURNKEY PROJECTS?

Author(s): Marchal, Clémence (Independent researcher)

Presentation Format: Oral

Clergy houses could be found in every parish of Catholic Flanders (Belgium) throughout the medieval and post-medieval periods. While some of them stood the test of time, others were modified, enlarged, destroyed and/or (partially) reconstructed throughout the centuries. Most commonly, they were renovated in the 18th century, and consequently rectories today are often imposing, whitewashed two story buildings located next to the church. However, a wider variety of rectories existed, with evidence in some cases reaching back to the 12th century.

In Flanders, research on clergy houses has primarily focused on individual cases, mostly in the context of renovation campaigns. A general perspective is still missing. Nonetheless, these case studies can now be used to answer questions on a broader level. This paper aims to explore and explain variability amongst (post-)medieval rectories in Flanders by analyzing architectural elements and building techniques as well as their broader spatial setting, including contextual elements such as location, spatial relations with the village and with other ecclesiastical buildings, organization within the site and landscape elements. As such, the study takes on an interdisciplinary character, integrating archaeological and landscape-historical data with more traditional build-historical aspects.

The study will not only present a framework for the interpretation of rectories but it also aims to be a contribution to the future management of these heritage sites. Mainly owned by the Church and by municipalities, these sites are under threat in the present financial climate. Many sites are currently being sold or redeveloped. A better understanding of these sites will support the decision-making process.

13 BUILDING FOR ETERNITY? EARLY TUFF BRICK BUILDINGS IN URBAN CONTEXT IN THE NETHERLANDS

Author(s): Bouwmeester, Jeroen (Cultural Heritage Agency of the Netherlands)

Presentation Format: Oral

One well known element of the 11th and 12th century in the Netherlands are the stone churches, mostly made out of tuff brick. The stone was imported from the Eifel region in Germany. The urban settlements Utrecht and especially Deventer played a central role in the distribution of these stones. Both settlements were under control by the Bishop of Utrecht. It was in these towns also early secular buildings, presumably of episcopal ministeriales, were made of tuff brick. This paper will explore what these buildings might have looked like, what their function was, who built these buildings and why. This last aspect is very important. These buildings were not only functional but also expressed other meanings. Especially the 11th and 12th century were the ages in which the pre-urban settlement evolved into the first early towns. The rise of these buildings of the urban elite are a reflection of this process. Using the same material as the churches they might even have had eternity on their mind. Unfortunately for the builders only small parts of their buildings still remain, often hidden underground or within existing buildings. Although the buildings have gone, the ideas behind them have evolved into the urban landscape of nowadays...

14 **AMBITION AND ARCHITECTURE: IDENTITIES IN MEDIEVAL LODGING RANGES**

Author(s): Kerr, Sarah (Trinity College Dublin)

Presentation Format: Oral

This paper explores lodging ranges, a type of communal-living building, built in the late medieval period in England and Wales. They had a multi-faceted function ranging from the obvious use as accommodation for a lord's retainers to enforcing subtle social and political meanings, and displaying complex identities.

This was a period of great change; the Wars of the Roses occurred in the mid-15th century after decades of political turbulence, a cash-based feudal system developed, and there was an increase in new-money families. This contributed to greater social mobility, a convoluted hierarchy and a permeable nobility; as a result greater importance was placed on display of identity evidenced by the construction of lodging ranges.

Thorough examination of the architecture reveals lodging ranges were built to construct a sense of collective identity between young men drawn from different families and harness them to the identity of the lord himself. Within this collective identity there was a sub-hierarchy, harking to a household in itself. Innovative methods enforcing this hierarchy were introduced in some examples of lodging ranges, something of a contrast to the flexible use of space expected in medieval buildings.

This method of displaying the hierarchy was a form of control: to suppress mobility between social strata, particularly the upwards movement, in what Christine Carpenter called 'the age of ambition' (Carpenter 1992). Manipulation of space administered further control, in fact it set in stone the retainers' place in society.

15 **HOUSE SOCIETIES AND THE EUROPEAN MILITARY ELITE: CHANGES IN CASTLE DESIGN SEEN THROUGH A HOUSE SOCIETY MODEL**

Author(s): Kirk, Scott (University of New Mexico)

Presentation Format: Oral

While castles have been studied for the past several centuries, there is very little agreement in the academic community as to why they developed and the impetus for changes that occurred in their design between the 10th through the 18th Centuries AD. Further complicating matters, a debate has arisen over whether the castle served as an elite residence or a defensive fortification, creating a false dichotomy. This paper uses a house societies model, of the type first proposed by Levi-Straus in 1975, as a theoretical framework from which to analyze the castle. Beginning with the assumptions that 1) the elite class of the Middle Ages was tied to military service and 2) that houses need elements of production, defense, and elite pageantry, in order to survive and reproduce themselves socially across generations, this study builds a series of mathematical indices using architectural features for a sample of over 100 castles spread across the UK, Iberia, the Czech Republic, and Sicily to gain new insights as to how castles relate to each other across Europe, how they changed over time, and how invested they were in in each of the elements needed for the survival of the house. Seeing the castle as a physical manifestation of medieval social organization, this study offers a fresh take on many ideas that have been proposed for understanding castles through the use of a more anthropological framework centered around the concept of the house.

16 **CASTRA TERRAE CULMENSIS. NEW SOURCES FOR THE DEFENSE ARCHITECTURE OF THE TEUTONIC KNIGHTS**

Author(s): Wiewióra, Marcin (Nicolaus Copernicus University in Torun, Institute of Archaeology) - Wasik, Bogusz (Nicolaus Copernicus University)

Presentation Format: Oral

Fortress construction by the Teutonic Order is one of the more interesting architectural and artistic phenomena of the first half of the 13th to the mid-15th century in medieval Europe. Earth-and-timber strongholds, and then masonry-wall castles, were created as part of a broad and well-prepared construction undertaking. This resulted in several dozen defensive buildings being built all across the area of the State of the Teutonic Order. The results of recent archaeological and architectural studies have provided many new data which show, among other things, that strongholds built in different periods differed not only in architectural form, but also in construction technique and the course of the construction process. For many years there has been discussion on the pattern according to which the construction of Teutonic strongholds developed. Based on historical records and archaeological findings to date, it has been assumed that most of the masonry-wall Teutonic castles were built at the site of earlier fortifications (of Slavic or Prussian tribes). As a rule, the oldest defensive buildings erected by the Teutonic Order were earth-and-timber structures, which were successively replaced by brick and stone structures. The following issues therefore remain unexplained or poorly understood: were the castles always built at the site of earlier defensive settlements? What were the stages of construction for the wooden phase and the brick phase; were the oldest, irregular castles and the younger, regular objects created using the same construction methods and techniques as, and, if so, what were those techniques? From 2016 Nicolaus Copernicus University's Institute of Archaeology in Toruń conducted a research programme called "Castra Terrae Culmensis, at the edges of the Christian world".

17 BUILDING IN THE NEAR EAST BETWEEN LATE ANTIQUITY AND THE EARLY MIDDLE AGES: THE CASE OF THE JORDANIAN HAWRĀN

Author(s): Gilento, Piero (Universite Paris 1 - Panthéon Sorbonne)

Presentation Format: Oral

Northern Jordan has a complex system of ancient villages built almost entirely in basalt which, thanks to particular historical-cultural and geological-environmental convergences, have arrived until today in a reasonable state of conservation. It is a built landscape located in the semi-desert border zone between nowadays Jordan and Syria (the so-called Hawrān) which for centuries has been part of a network of important communication routes between the Mediterranean coast and the Arabian Peninsula and it was the result of the meeting and merging of different cultures: Nabatean, Roman, Byzantine, Sassanid and Islamic. In this context, architecture fully represents these cultural influences and becomes a fundamental source of information, specially for the Late Antiquity and the Early Middle Ages, not only from the point of view of material culture but also for the study of the social and cultural phenomena behind historical crucial changes.

Thanks to an archaeological approach to the analysis of architecture (i.e. Building Archaeology) it was possible to enter into the complex historical sequence of different buildings, sometimes very difficult to decode due to a massive reuse of the same building material and a certain continuity in the use of construction techniques. Moreover, a specific study on construction techniques is also allowing to create a chrono-typological atlas, a useful tool for dating and comparing architecture at a regional scale.

Starting from a specific case study, the village of Umm as-Surab, we will try to better understand the relationship between architecture and landscape and architecture and technological development, investigating the birth and evolution of some construction techniques and building typologies.

Finally, we will focus on the need for intervention strategies for the documentation, conservation and communication of a cultural heritage that can become an important source of development for local communities, ever more careful and aware of their past.

18 URBANIZATION PROCESSES BEFORE DE CONSTRUCTION OF THE 14TH CENTURY WALL. THE CASE OF CARDONA, BARCELONA

Author(s): Pancorbo, Ainhoa (City Council of Cardona) - Galera, Andreu (City Council of Cardona; Historical Archive of Cardona)

Presentation Format: Oral

The archaeological works carried out during 2015-2017 in Cardona have contributed to a better knowledge about the urbanization processes prior to the delimitation of the current urban core by the new walls constructed in the last third of the 14th century. Both excavations and documentary research show us the urban plot of Soldevila, a suburb born between 12th and 13th centuries in the periphery of the ancient town of Cardona, around the paths leading to the salt valley and to the city of Barcelona.

It was known thanks to written sources that the castle and its town could be dated between the 8th and the 10th century, in the context of the Carolingian occupation and the concession of two town charts, the first one in 870 and the second one in 986. Despite that, we didn't know much about them. Now, for the first time we have enough information about Soldevila to somehow draw its evolution from the early Middle Ages to the 14th century. Then, in the context of the war against Castilla, broke out in 1356, and later with the entry in to country of the mercenary companies, the urgent necessity of defending themselves conducted to the construction of a new walled perimeter.

It must be said that that research is the result of the City Council bet, since 1990, on the historical and archaeological heritage of Cardona as one of the main axes of the local culture and economy. One of the first goals in that sense was the legal protection of the old town which finally lead into the organization of a urban archaeology department.

19 JEWS' COURT, LINCOLN. A PROPOSED NEW METHODOLOGICAL APPROACH EXAMINING THE INTEGRATION OF THE ANGLO-JEWISH COMMUNITY IN THE MEDIEVAL URBAN SPACE

Author(s): Robinson Wild, Esther (University of York)

Presentation Format: Oral

Jews' Court is a building that has been assigned disparate primary construction dates ranging from c.1170, post-1300 and the early to mid-17th century. It has also been assigned possible synagogue use during the high medieval period. This paper discusses research undertaken on the evidence-base for the assignment of synagogue use by Cecil Roth, a prominent researcher of Jewish history and the attempt to contextualise this perceived historic use in terms of the historical narrative of the building, the medieval Anglo-Jewish community, and their extant material culture. It considers questions the research has raised about the dominant historic narrative, the use and management of the building today and the general issues of presenting medieval Anglo-Jewish history in the heritage space.

The historiography of Medieval Anglo-Jewry is generally consistent with opinion on the level of interaction of Jews with their Christian neighbours in the urban space. This typically references marked differences in religion and customs and secular aspects of medieval English society that precluded Jews from integrating fully and upon which the construction of their 'otherness' is based. Recourse to the European model of community, specifically the requirements for communal buildings, when interrogating the English documentary and archaeological record is a dominant strand.

This paper further discusses how a buildings archaeology and urban morphological approach may bring about a reconsideration of the evidence for the Anglo-Jewish community and the level of social inclusion and integration. It discusses intermediary research findings which suggest a different and place-specific, model of community that differs from that of Europe, the English medieval urban context. These findings suggest a level of urban belonging at odds with the predominant narrative of the Jew as an Outsider in the historiography and the facilitating of ritual and customs was adapted to address the constraints of the medieval urban space.

550

CURRENT RESEARCH INTO THE ARCHAEOLOGY OF THE BALTIC REGION

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Wadył, Sławomir (Institute of Archaeology, University of Warsaw) - Shiroukhov, Roman (Zentrum für Baltische und Skandinavische Archäologie, Schleswig) - Jahn, Christoph (Museum für Vor- und Frühgeschichte, Berlin)

Format: Regular session

The session Current Research into the Archaeology of the Baltic Region Iron Age is intended to be a kind of overview of the recent and current research, studies and research projects concerning the archaeology of the Balts and their neighbours. The archaeology of the Baltic region is understood here as an archaeology of Baltic cultural circle – Baltic rim. The chronology for expected contributing papers is supposed to start with the Bronze Age/Iron Age and ends with the collapse of the tribal institutions in that area in the 13th century.

We are interested mostly in papers presenting new research projects and results of the studies on the widely understood cultural development in the context of Baltic region.

The papers on methodology, chronology and typology of the Baltic region archaeological sites and artefacts are highly welcomed. Fundamental questions about the cultural development, intercultural and cross-cultural relations of the Baltic people, and different issues concerning the civilization development will be discussed in this section.

ABSTRACTS

01 INTRODUCTION: ARCHAEOLOGICAL RESEARCH IN THE BALTIC REGION - DIFFERENT COUNTRIES, VARIOUS APPROACHES, COMMON GOALS

Author(s): Wadył, Sławomir (Institute of Archaeology, University of Warsaw) - Jahn, Christoph (Museum für Vor- und Frühgeschichte, Berlin) - Shiroukhov, Roman (Zentrum für Baltische und Skandinavische Archäologie, Schleswig)

Presentation Format: Oral

Even though the Baltic region covers a relatively small area, the archaeological heritage is very rich and diverse, and therefore the number of scientific problems remains high. Nowadays, many different countries are participating in modern archaeological research in this area: Germany, Poland, Russia, Lithuania, Latvia, Estonia and the Scandinavian countries. This research is very much based on international exchange and cooperation. However, archaeological research is also still very much influenced by the modern history of the 20th century. With different country-specific historical perspectives on the Baltic region, the scientific approaches can also be very different. Whereas the German perspective is very much focused on the pre-war research in East Prussia, the modern research in Poland, Russia, Lithuania, Latvia and Estonia can answer a different set of scientific issues with modern excavation techniques and new dating and analysis technologies. The combination of these different approaches is an essential element for answering the fundamental questions about the cultural development, intercultural and cross-cultural relations of the Baltic people, as well as chronological and typological issues. With the opening paper authors would like to present programmatic assumptions and draw attention to the most relevant and intriguing topics of the archaeology of the Baltic Region.

02 PERSONAL LATE NEOLITHIC AMBER AND BONE ADORNMENT OF LAKE LUBANA WETLAND IN SOCIAL AND ECONOMIC CONTEXT

Author(s): Loze, Ilse Biruta (corresponding member of Latvian Academy of Science)

Presentation Format: Oral

The Eastern Baltic region, its middle and southern parts, is the part where the amber is washed ashore by the Baltic Sea. For this reason, already from the end of the 19th century, the amber artefacts relinquished by the sea and found at the site of the Juodkrante port and the monograph of 1882 by Rihards Klebs dedicated to these finds marked the beginning of the study of Neolithic amber.

A fundamental range of Neolithic amber jewellery has been acquired in two of the most important archaeological sites in the middle of Eastern Baltic region, – the territory of Latvia. These are the very great Neolithic Zvejnieki burial field (Zagorskis 1987, Zagorska 2005) and the very small Abora Late Neolithic burial place located in Lake Lubāns Wetland (Loze 1979, 2008).

These issues also require ideological constructions along with socially interpreted ones. The economy originally relies primarily on a separate ceremony of presenting adornments, which is, first of all, regarded as part of a ritual economy formed during initial contacts.

The successful excavation work of my two colleagues in Zvejnieku Neolithic burial field has resulted in obtaining superior adornments of privileged individuals, which are marked by great versatility, and along with comb pottery gravesites researched in the territory of Finland reflected the creation of amber and slate jewellery of this period.

03 LOST AND FOUND: NEW RESEARCH ON THE ROMAN AND MIGRATION PERIOD IN EAST PRUSSIA AT THE PRUSSIA-COLLECTION (BERLIN AND KALININGRAD)

Author(s): Jahn, Christoph - Szter, Izabela (Museum für Vor- und Frühgeschichte, Berlin)

Presentation Format: Oral

The exceptionally rich archaeological tradition in former East Prussia was a cornerstone in the early stage of the research on the Roman and Migration period in the Baltic area before 1945, but compared to the vast number of archaeological excavations, only a relatively small amount of publications had been brought to scientific attention. The recent research project at the Museum for Pre- and Early History Berlin aims at the reconstruction of the numerous archaeological excavations in East Prussia before WWII. The systematic documentation and analysis of objects is essential for the understanding of the dynamics of burial rites in East Prussia and enables a new approach to the perception of the Roman and Migration period in the Baltic area. This presentation reports the latest re-discoveries and re-identifications of burial finds at the Prussia-collection in Berlin. We will also discuss the re-construction of grave contexts with the help of archival materials, and also the scientific evaluation of selected cemeteries and groups of objects. Moreover, an institutional cooperation between the museums in Berlin and the Museum of History and Art in Kaliningrad (Russia) was established. This cooperation allows for the first systematic overview of the archaeological material from the Prussia-collection in Kaliningrad. This new research on the Prussia-collection in Berlin and Kaliningrad offers enormous potential for the modern research on the Central European Barbaricum – especially for current Polish, Russian and Lithuanian archaeology in this region.

04 ROMAN INFLUENCES IN THE JEWELRY ART OF WESTERN BALTS ACCORDING TO THE PERSONAL ORNAMENTATION ARTEFACT ASSEMBLAGE IN OPUS INTERRASILE STYLE

Author(s): Khomiakova, Olga (Institute of Archaeology of RAS, Moscow)

Presentation Format: Oral

The openwork ornamentation style is widely represented in the decoration of personal ornaments of the Roman period in a number of cultures of East European Barbaricum. Artefacts with slitting decor, associated with the technique of opus interrasile, belong to them. The opus interrasile technique is based on a varieties of openwork style, combining Late Latenian and Roman traditions. The style is known from the decorating of the Roman military uniform details and the personal ornamentation assemblage from Roman provinces of the first centuries AD.

As a result of the cultural change processes in the South-Eastern Baltic connected with «Amber Trade» and Roman influences in the 1st–2nd centuries AD, artefacts decorated in openwork style appeared in at the territories of the West Balts Circle. The earliest examples of using the openwork ornamentation in decorating objects in Eastern European territories are known from the Sambian-Nathangian culture. Since the 3rd century openwork ornamentation was used in the decoration of artefacts from West-Lithuanian area. The openwork style is common to a jewelry art of Latvian and Estonian areas. Artefacts with a slitting decor are known in other Eastern European territories, primarily in the cultures of the Early Slavonic cultures.

The study is devoted to the personal ornamentation artefact assemblage in opus interrasile style of Western Balts and the forest-steppe zone cultures of Eastern Europe. The assemblage represent a massif of the different-type ornaments, associated with a few territorial-chronological groups, distinguished with their own set of stylistic features.

05 DIETARY ASPECTS OF THE WEST LITHUANIAN PEOPLE WITH REFERENCE TO HOUSEHOLD AND FUNERARY POTTERY

Author(s): Bliujiene, Audrone (Klaipeda University) - Matulaitienė, Ieva (-); Garbaras, Andrius (-); Ulozaitė, Regina (-); Bračiulienė, Ramunė (-)

Presentation Format: Oral

We present the results of an interdisciplinary investigation into dietary aspects of peoples who lived in western Lithuania (the Culture of Burials Encircled with Stones) from the beginning of the 3rd to the middle of the 5th centuries. Organic residue or food crust adhered to surfaces of handmade household ware and funerary miniature pots, were analysed by use of the Fourier Transform Infrared (FTIR) and mass spectrometry methods. $\delta^{13}\text{C}$ isotope analysis shows a considerable difference between the residue from household and funerary pottery. $\delta^{13}\text{C}$ isotope ratios in the samples from miniature pots vary in a relatively narrow range and indicate that organic material present in the pots might be of similar origin. $\delta^{13}\text{C}$ isotope ratio values allow to suggest that funerary miniature pots might have been filled with beer made from barley and/or oats. $\delta^{15}\text{N}$ isotope value and C–O group carboxyl group as well as polysaccharides indicate presence of proteins in miniature pots, thus it can be suggested that pots were filled with fermented milk-based beverage. Miniature pots were placed in burials and filled with a symbolic amount (40/50 to 100 ml) of beer, or milk-based, fermented beverages.

$\delta^{13}\text{C}$ isotope ratio of household vessels varied in the wider range, this shows that food was mainly C3 types of grain (barley, oat and rye). $\delta^{15}\text{N}$ values retrieved from organic residue indicate that people's diet might also have included herbivores such as cattle

(cows), sheep's/goats, horses, and omnivores such as pigs. With combining of $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ isotope ratio values we can conclude that material found in household vessels was not homogeneous and had both plant and animal substances. This study has also clarified that people's diet was mostly based on terrestrial food from agriculture and animal breeding.

06 URN – ACCESSORY VESSEL – LID. MYSTERIOUS FUNCTION OF BALT CUP IN THE MIGRATION PERIOD

Author(s): Nowakowski, Wojciech (Institut of Archaeology, Warsaw University)

Presentation Format: Oral

Archaeologists do not value very highly the pottery made by Balts in the Migration Period. However they really appreciate the cups with hollow foot, one of the most important indicators of the Olsztyn group in the southwestern Masuria. These thin-walled carefully smoothed cups, interpreted as tableware clearly out stand. It can even be assumed that they were used to drink some luxurious liquids, however is not clear what kind of drinks it could be.

The cups with hollow foot are usually found together with table or kitchen pottery in settlements context. Often enough they are also found in the graves where, as we can expect, they were deposited as an additional gift, perhaps with some liquid within, playing a role of accessory vessel.

In the beginning of the 20th century, several hundred graves of the Migration Period were found in the cemetery of Olsztyn group in Miętkie. The analysis of their content can suggest another function of the cups. In some cases they just played a role of urns, but they were also used as lids, though their shape doesn't fit that purpose.

Today, it is difficult (or even impossible) to define the rule determining the specific purpose the cups found in graves were used for. This is even more complicated because of the state of old documentation – the brevity of the descriptions and inaccuracy of the sketches do not allow to present a convincing thesis about the factors determining the function as size or decoration.

We can only hope that further research would provide new data, which will make possible the clarification of the role that these cups played in the daily life and afterlife of people living in Masuria during the Migration Period.

07 THE LONG SEVENTH CENTURY. NEW RESEARCH ON THE BEGINNING OF EARLY MIDDLE AGES IN THE MASURIAN LAKE DISTRICT

Author(s): Wadył, Sławomir (Institute of Archaeology, University of Warsaw)

Presentation Format: Oral

The 'making' of Early Medieval Prussia, especially in its southern range is one of most relevant topics in the archaeology of Western Balts. In the late Migration Period (ca. 475-670 AD), the Masurian Lake District was inhabited by peoples of the Olsztyn group.

Only a few theories concerning the decline of the Olsztyn group and the beginning of the Early Medieval Old Prussian culture have been proposed. According to the general opinion, the fall of the Olsztyn group occurred in the middle of the 7th century. Recently, several hypotheses suggesting continuation of that cultural unit at least until the end of the 7th and the beginning or even first decades of the 8th century have been presented.

There is significant evidence that some types of artefacts found at cemeteries and a few settlements are of later (i.e., late 7th-8th c.) chronology (e.g., iron and bronze spurs with bent-in hooks, equal-armed brooches or miniature rectangular brooches).

There is no reason to believe in a cultural collapse understood as depopulation. Certain settlements were still used, new ones were established. However, what constitutes a new quality in the West Baltic lands is the emergence of defensive settlements. It's worth pointing out that the earliest stronghold in Masuria was established ca. 700 AD in Pasym. So far, the stronghold in Pasym is the only one that can be dated to the final phase of the Migration Period (e.g., brooches of Wólka Prusinowska type, trapeze pendants) and the beginning of the Early Middle Ages (antler combs, pivoting knife of Anglo-Saxon type, so-called belt hook, antler side plate, Birka/Čaplin/Pasym/Klimy type spur).

08 MEMORY REMAINS –NØRRE SANDEGÅRD VEST CEMETERY FROM THE LATE GERMANIC IRON AGE.

Author(s): Czonstke, Karolina (Archaeological Museum in Gdańsk; University of Gdansk) - Świątkowski, Bartosz (University of Gdansk)

Presentation Format: Oral

Nørre Sandegård is located in the north-eastern part of the island of Bornholm. It is one of the richest necropolises from the period from 6th to 8th century in Denmark. It was discovered in the 19th century by local authority Amtmand E. Vedel. In his report, he mentioned a cemetery with well visible kurgans located near the coast and farm called Nørre Sandegård. However during the years the kurgans were destroyed by tillage and information about the localization of the cemetery disappeared from human memory. The accidental discovery near the top of the hills in 1980s was an impulse to come back to the place and start new archeological research. The place was called Nørre Sandegård Vest. The researchers - Lars Jørgensen and Anne Nørgård Jørgensen, who investigated the place in 1980s discovered 47 graves. The accidental discovery of a woman's burial in 2013 was an incentive to undertake new excavations. In the course of work carried out in 2014 and 2016 we were able to determine that the cemetery was larger than previously thought. Since 2014 close to 40 skeletal burials of men, women and children had been found and studied. The deceased were accompanied by numerous grave goods.

The research conducted in the cemetery at Nørre Sandegård Vest, may contribute to the knowledge of the socio-cultural situation

on the island in the beginning of the Viking period, one of the starting points for the changes that took place in the Baltic Sea region in the early Middle Ages.

09 HERMANN SOMMER AND HIS ARCHIVE FISCHHAUSEN: GAINING NEW INFORMATION FROM A PRE-WAR DATA SOURCE

Author(s): Prassolow, Jaroslaw Aleksei (ZBSA)

Presentation Format: Oral

The last decades are marked in the archaeological research of the Baltic Sea region by the ever growing interest to the heritage of the former Sambian (nowadays Kaliningrad) Peninsula, whose major part formed from 1818 to 1939 the administrative district Fischhausen of the former German province East Prussia (nowadays territory of the Kaliningrad region of the Russian Federation). Archaeological data in the area in question are currently won on one of the two complementary ways: either through modern archaeological field research or due to the re-discovery and subsequent analysis of the pre-war data. Private archives of the researchers, which investigated the local archaeological material up to 1945, belong to the most informative of the available data sources. While archives of many pre-war researches of East Prussia (Otto Tischler, Herbert Jankuhn, Carl Engel, Marta Schmiedehelm and Feliks Jakobson) are well known to and intensively used by the modern generation of their colleagues, the research potential of the archive of Hermann Sommer - the last Kreispfleger in the East Prussian administrative district of Fischhausen, stayed until now unrecognized i.e. largely underestimated. The major goal of the current presentation is thus to re-introduce this archive into scientific research as well as to draw the attention of scientific community to its existence. Short description of the archive rescue in the last months of World War II will be followed by the overview of its scientific potential, illustrated by practical examples of the archival data application to the reconstruction of the pre-war state of archaeological research in the former East Prussia.

10 NEW DATING APPROACHES FOR THE LATE IRON AGE OF THE SOUTH-EAST BALTIC REGION

Author(s): Shiroukhov, Roman (Zentrum für Baltische und Skandinavische Archäologie Stiftung Schleswig-Holsteinische Landesmuseen Schloss Gottorf)

Presentation Format: Oral

Historical archaeology of the East Baltic region is complicated. The problem of the period lies in the incompatibility of the "absolute" category of historical time and the "relative" archaeological one. Archaeological features remain outside the "absolute" or natural-science dating, and of known historical processes.

The main objective of the project is to create a working chronological scheme, applying dating techniques not used for this data before. Kaliningrad region of Russia and West Lithuania were selected because of the dense concentration of Prussian, Curonian and Scalvian cemeteries. Western Balts archaeological sources represent good opportunity for dating. A combination of local and imported goods within the same cremation graves allows a comparison of their relative dating. The implementation of the project is based on following methods:

1. GIS. Through the ArcGIS software cemeteries objects will be associated with a chronological layer. Thus, the concentration, intensity and spatial relation of such objects at sites will be revealed. As a result, 3D time-maps of cemeteries are created on the basis of the relative chronology of the objects.
2. Statistics. Dating types of artefacts will enable deposits with the same finds from different cemeteries to be connected. Deposits will be analysed statistically to provide a chronological sequence of groups of features that give the clearest relative dates.
3. 14C AMS. According to the GIS and statistic data, a series of objects with the best relative dates selected. Graves organic samples are used to obtain the absolute date linked to the radiocarbon scale. 14C dates from several selected sites are correlated with the dates obtained by the first two methods.

Sealed archaeological deposits and artefacts dates will be mutually verified and revised by each of 3 cultures dataset. Theoretically, it'll be possible to compare the processes of development of material culture with a sequence of the written sources events.

11 GENOME-WIDE ANCIENT DNA EXPOSES THE TURNING POINTS OF THE FINNISH POPULATION HISTORY

Author(s): Majander, Kerttu (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena; Institute for Archaeological Sciences, University of Tübingen; Department of Biosciences, University of Helsinki) - Salmela, Elina (Department of Biosciences, University of Helsinki; Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena) - Salo, Kati (Department of Philosophy, History, Culture and Art Studies, University of Helsinki) - Lamnidis, Theseas - Schiffels, Stephan (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena) - Onkamo, Päivi (Department of Biology, University of Turku; Department of Biosciences, University of Helsinki) - Krause, Johannes (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena; Institute for Archaeological Sciences, University of Tübingen)

Presentation Format: Oral

The Finnish population has been strongly shaped by its geographic location between east and west. In modern Finns, a genetic division in mitochondrial lineages is recognised, forming two distinct regions: Northeastern Finland maintains a gene pool more similar to the hunter-gatherers of the Mesolithic, whereas Southwestern Finland carries more ancestry introduced during Neolithisation. These substructures signify exceptionally recent genetic transitions, to which ancient DNA (aDNA) techniques can provide an un-

paralleled insight.

Here we analyse genome-wide data from over 30 individuals, representing ten archaeological burial sites from southern Finland that span from 5th to 19th century. Comparing them with surrounding ancient and modern populations, we find that the earliest individuals have genotypes generally connected with prehistoric hunter-gatherers, specifically resembling those of the contemporary Saami people. The late Iron Age to early Modern Era individuals, instead, show a more Eastern or Central European composition. Our results suggest a population shift during the Iron Age, possibly related to Slavic and Baltic influences, also manifested in the archaeological record of the local artefacts. Our observations depict a temporally complex and regionally diverse population history in Finland, agreeing with the archaeological models of delayed and gradual adopting of agriculture, and urge for further in-depth aDNA investigations in Finland and its neighbouring regions.

12 AT THE JUNCTION OF CULTURES- SLAVONIC-SCANDINAVIAN RELATIONS IN THE 10TH AND 11TH CENTURY

Author(s): Czonstke, Karolina (Archaeological Museum in Gdańsk; University of Gdansk) - Świątkowski, Bartosz (University of Gdansk)

Presentation Format: Oral

The 10th and 11th centuries are considered to be very dynamic times in terms of political, economic and social reasons. These times are connected not only with newly appeared and evolved new countries and dynasties, which pursue their own politics, but also with the development of the trade route, inter alia, in the Baltic Sea region. At this moment such trade centers as Birka, Hedeby, Truso or Wolin arise and develop as well. Consequently the meeting and interpenetration of different cultural backgrounds takes place, what contributes to the generating of an interesting cultural mosaic on both sides of the Baltic Sea. The material aspects of these relations are not only the finds related with the Vikings, which were discovered in nearly the entire area of Europe but also artifacts, which appeared in Scandinavia from different parts of the continent, including the southern coast of the Baltic. One category of finds from the land of the Slavonic was not only the ceramics, but also silver jewellery. The ore, which it was made of, was an important element in the early medieval economic system in the Baltic region.

The basis for discussion in the paper is the Slavonic jewellery and pottery that comes with treasures, graveyard and loose finds from Bornholm. They also indicate some parallels between the composition of silver treasure and pottery from Pomerania and Southern Sweden.

Slavonic jewellery and pottery can be considered as a pretext for the reflections on the directions and forms of its influx to the island and the functions that it could perform.

13 NEW DISCOVERIES ON THE CURONIAN ARCHAEOLOGY USING METAL DETECTORS

Author(s): Civilyte, Agne (Lithuanian Institute for History) - Shiroukhov, Roman (Zentrum für baltische und skandinavische Archäologie Schleswig)

Presentation Format: Oral

During the last couple of years archaeological surveying using metal detectors has increased in Lithuania as a new method to discover metal artifacts and archaeological sites. There has been intensive collaboration in Western Lithuania between metal-detectorists and professional archaeologists. The metals finds derive not only from existing major find spots, but come in large numbers from the interior part of the country from previously unknown sites. One such expeditions had given an unexpectedly large amount of metal artifacts, which belong to the Western Lithuanian archaeological cultures and can be identified as Curonian, belonging to the Late Iron Age. These finds suggest the existence of settlement site. Since Curonian settlements are very rare, the finds represent an important step towards investigating the settlement archaeology of the region. The artifacts found at the site from on the one hand are similar to the archaeological data from such Curonian cemeteries as Bandužiai, Girkaliai, Laiviai and Palanga, on the other hand they remind us some data from the few of excavated Curonian settlements as Palabga and Žardė. This paper deals with the first results of this survey in order to compare the archaeological material with other known Curonian sites. We also want to stress the importance of legal cooperation between archaeologists and metal detectorist as a successful method for the future research.

14 CREMATION BURIALS BETWEEN THE BARROWS

Author(s): Šmigelskas, Ramunas (Association of Lithuanian Archaeology; The Lithuanian Institute of History)

Presentation Format: Oral

The middle of the 13th century is the time of formation of the early Lithuanian state: unification of the tribes. In the middle of 13th century, Mindaugas, the ruler of this state, was baptized and crowned as a King of Kingdom of Lithuania. Nothing is known about Christianity impact on society within first try to baptize the community. Questions concerning reflection of these events of the past in the material culture remain without answers: how they are reflected and whether they are reflected. The early history of the Grand Duchy of Lithuania starts on the current territory of Eastern Lithuania. The roots of the Grand Duchy of Lithuania lie in the territory, which is known to contemporary archaeologists as Eastern Lithuania barrow culture. Geographically, this culture covers the current territory of Eastern Lithuania and some part of Western Belarus. The first barrows appeared in 2nd or 3rd century. From the 6th century bodies are cremated. Unclear date of the end of barrow piling period 11th or 13th century. After disappearing of the barrow burial custom, on the territory of ethnic Lithuania, before the baptism in 1387, cremated dead bodies were buried in the flat burial

grounds. The research conducted in the recent years, which was intended for 13th – 15th century burial grounds for cremated bodies, has shown that burials took place in small hills, on low river banks and burials took place even in water, various locations flooded with river or lake water and in swamps. Archaeological research has been carried out over the last two years between the barrows. The results (findings and AMS dating) let us to talk about new burial form (spreading the ashes and cremated crushed bones on the surface between the barrows) in this region starting even 9th century until 13th-14th century.

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THE WESTERN MEDITERRANEAN SEA: A CROSSROAD OF OBJECTS, HUMANS AND IDEAS

Theme: Mediterranean seascapes

Organisers: Nervi, Cristina (MIUR - Ministero dell'Istruzione dell'Università e della Ricerca) - Soria, Vincenzo (UNIQ - Centre for Archaeology of the University of Lisbon) - Minetto, Gianluca (UniUPO - University of the Oriental Piedmont)

Format: Regular session

The Western Mediterranean Sea is composed of a network of interconnected coastal areas. During the centuries, the most various actors have created a multifaceted arena in which emerged a rich and a various material and intangible cultural heritage. From Portugal to Italy, from Spain to Northern Africa, from France to Corsica, Sardinia, Sicily and Malta, it is possible to see how their archaeological, historical, cultural and ethnographic aspects are similar and comparable each other. Nevertheless, this consideration is the “tip of an iceberg” of complex processes of construction of distinctiveness of these territories. Unveiling and analyzing clearly defined events, longstanding practices and cross-cultural knowledge flow may help in defining and describing the specificity of the contexts or situations analyzed in a historical or ahistorical perspective.

This session deals with the analysis of the exchanges and meeting, not only intended as export/import of goods (e.g. pottery, wheat, metals), but also as cultural import/export (e.g. traditions, life styles, building techniques, cults).

ABSTRACTS

01 IBERIAN PENINSULA AND CENTRAL MEDITERRANEAN IN LATE PREHISTORY: THE METAL FINDS FROM THE HOARDS BETWEEN TRADES, SOCIO-CULTURAL SYMBOLISM AND TECHNOLOGY

Author(s): Giardino, Claudio (University of Salento) - Bottaini, Carlo (University of Évora)

Presentation Format: Oral

In this study, we investigated the presence in the hoards of metal types that are common to both the Central Mediterranean and the Iberian Peninsula during the late prehistory (13th century / 8th century BC). These finds were examined for the morphological and functional aspects - in their dimension and social value - and for the archaeo-metallurgical aspects - i.e. for their chemical composition and metallographic characterization.

The metal artifacts from the hoards are in fact evidence of intentional behaviors, linked to particular options and beliefs, thus representing the adherence to shared social strategies within a specific community. The deposited objects cease to function on the practical level - the dimension for which most of them were produced - as “things” or “commodities” - to become active at a symbolic and metaphorical level, becoming “gifts” or “valuables”. This transformation is not related to typological and / or technological considerations, but is connected to social processes, where the objects accumulate “culturally specific meanings”.

Therefore, metal hoards are built up according to codified and shared rules reflecting conscious and intentional social behaviors and conventions. Accordingly, their structure may reveal important information about the ancient societies, especially with regard to technology, social articulation, economical organization, contact networks, and symbolic dimension.

The unusual metal items that testify contacts between various areas of Europe assume a very particular value in this context.

02 LIPARI: THE NECROPOLIS OF CONTRADA DIANA FROM THE ROMAN CONQUEST TO THE LATE-IMPERIAL AGE. NEW DEVELOPMENTS IN SICILIAN FUNERAL ARCHEOLOGY

Author(s): Casella, Valentina (University of Salento; University of Messina)

Presentation Format: Oral

The interest in the Sicilian funerary archaeology has always played a marginal role compared to other fields of research. This phenomenon concerns in particular the chronological period following the Roman conquest of the region. Through the critical analysis of the funeral ritual, the tomb type, the grave goods and funeral semata of the contrada Diana necropolis it is proposed to reconstruct the changes occurred in the funeral ideology and in the rituals traditions of Lipari's community following the 250 BC. Examining a total, for the first time registered, of more than 1200 burials we can see an important moment of caesura in the choice of the grave goods and of the tomb types between the first century BC and the first century AD. This caesura reveals the firsts elements of that “Romanisation” that will lead, a century later, to a general monumentalization as well as the choice of new specific tomb types. All this is a sign of an adaptation to the Roman funerary mos, and can be seen in several other contemporary necropolis of Sicily.

Additionally, it is interesting to note the predilection for the inhumation rite compared to the crematory rite, prevalent in Italian and Roman area at least until the first century AD. The case of Lipari appears to be emblematic, as it is the only site to date to have given us a considerable number of tombs dating without interruption from the Roman conquest until the second-third century AD. Lipari's necropolis representing an indispensable comparison for the reconstruction of the Sicilian "cities of the dead" in the Republican and Imperial Age, made difficult by the lack of research in the field and, sometimes, the obsolete character of the few published data.

03 NOT A PUNIC, NOT YET A ROMAN. SURPLUS TRADE AND TECHNOLOGICAL CHOICES OF THE TURDETANI DURING THE LATE IRON AGE

Author(s): Moreno Megias, Violeta (Universidad de Sevilla)

Presentation Format: Oral

This paper presents important remarks regarding the rural economy of the lower Guadalquivir Valley (SW Spain) between the end of the 6th century BC and the final Roman domination, considering the external connections that influenced the Pre-Roman Turdetani at a local and regional scale and that had a reflection in their pottery tradition. Some technological aspects demonstrate an undeniable Punic influence, suggesting that the technological knowledge could have been a Punic legacy and not a local achievement. Nevertheless, the quality of the products and the continuity of the pottery traditions are as successful as the shapes and technological processes of the Punic settlements of the coast.

The 3rd century BC represents a profound change of several aspects of the pottery industry, related to political and economic circumstances. Carmona exemplifies well the resistance to this critical situation, considering that the typical fabrics of the local workshops go on from the 4th century BC (or even earlier) to the beginning of the 1st century AD. This continuity is a result of the success of its economic structures, while other settlements begin to separate themselves from the circuits of supply and demand as they were unable to meet the requirements of a broader market area. On the contrary, Carmona never lost its preponderance and could extend its pottery tradition and the local shapes until the complete Romanization, and further. At this point, new authorities with a productive role are arising, some pottery workshops stop their activity and some innovations make an appearance in the compositional characterisation of the fabrics, for the first and only time.

It is then possible to understand the resilience of the cultural and technological tradition of the Turdetani from the perspective of the pottery tradition, which offers a point of reference throughout this controversial period.

04 ETHNIC TIES MOVE IN MYSTERIOUS WAYS: ROME AND THE SARDINIAN MERCENARIES, 238-7 BC

Author(s): Ventós, Gerard (Universitat de Girona)

Presentation Format: Oral

At the beginning of the 'Truceless War', the former Punic mercenaries based in Sardinia managed to control the island effectively, ruling over cities and striking coins. However, when Carthage eventually smashed the uprising in Africa, the Sardinian rebels were forced to appealing for support -twice- to an external power such as Rome. This paper aims to address the nature of the political and diplomatic relations between the Sardinian mercenaries and the Roman Republic, particularly through the numismatic evidence. Unfortunately, the Sardinian coins from this period remain problematic. Since some issues share a similar typology with Punic coins, there have been claims for their African connections. However, the iconographic analysis of the golden and bronze coins -head of Core on the obverse and recumbent bull on the reverse- suggests that non-African ethnic groups were also present in Sardinia, adding more complexity to this picture. Since the presence of Italians in the African uprising has been usually attested by the depiction of a similar bull image in their coins, it should be stressed that at least some Italian mercenaries were indeed based in Sardinia. Accordingly, if the coin evidence is to be trusted both the Sardinian rebels and Rome shared more than a powerful enemy like Carthage. It is thus reasonable to argue that the Sardinian mercenaries based their desperate diplomatic appeals of support on the ethnic ties ('homophylia' in Polybius' words) they still maintained with Italy and thus with Rome. In practical terms, the mercenaries' claims ultimately eased Rome's decision, since they probably adjusted to 'iustum bellum' and accordingly legitimized the Roman intervention in Sardinia.

05 REVISITING THE TRADE CONNECTIONS BETWEEN CORINTH AND THE PUNIC WEST IN THE CLASSICAL PERIOD: THE 'CORINTH PUNIC AMPHORA BUILDING PROJECT'

Author(s): Fantuzzi, Leandro (Fitch Laboratory, British School at Athens) - Sáez Romero, Antonio M. (Universidad de Sevilla) - Kiriati, Evangelia (Fitch Laboratory, British School at Athens) - Williams, Charles K. (American School of Classical Studies at Athens)

Presentation Format: Oral

Excavations between 1977 and 1979 in a building at the forum of Corinth uncovered a substantial amount of Punic amphorae and associated fish remains, indicative of an intense trade of processed fish products with the Punic West in the 5th century BC. Even today, the findings from the so-called 'Punic Amphora Building' (PAB) represent one of the most significant evidences of long-distance trade between the Eastern and the Western Mediterranean in the Classical period. In 1984, a first characterization of the Punic amphorae from this building suggested that these products came from the Strait of Gibraltar area, either northern Morocco or southern Spain, although the state-of-the-art at that moment did not allow for further conclusions. However, in the light of the increased knowledge of Punic amphora production centres experienced during the last decades, a recent re-examination of the

amphorae from the PAB pointed to the existence of various macroscopic fabrics that might be associated with different production centres or areas, mainly Gadir/Cádiz, but also Málaga, the bay of Algeciras and the Mediterranean and Atlantic coasts of Morocco, as well as a minor amount of probable Tunisian and western Sicily products. With the aim of assessing these provenance hypotheses, an analytical research program has been developed, based on the petrographic and chemical analysis of Punic amphorae from Corinth, as well as on comparison with data from production sites in southern Spain and northern Morocco. The objective of this contribution is to present the preliminary results of this archaeometric research, which will undoubtedly contribute significant new evidence on the organization of salted fish trade in the Punic West and the commercial relationships between Corinth and the western Mediterranean in the Classical period.

06 “THINGS SPEAK AND ACT”: A RECONSIDERATION OF THE ITALIC BLACK-GLOSS TABLEWARE IN PORTUGAL

Author(s): Soria, Vincenzo (Uniarq- Centre for Archaeology of the University of Lisbon)

Presentation Format: Oral

During the 2nd and 1st century B.C., the Mediterranean Sea witnessed a vast export of black-gloss tableware produced in the Italic peninsula. This phenomenon has attracted several scholars that explained it pointing out the increasing impact of economic and military forces implicated in the emergence of the “imperialistic” Roman Republic.

In this vein, it has been suggested that social-behavioral change took place in the extra-italic territories, usually gathered under the Romanization umbrella. On the other hand, it has been showed the limitations of considering this kind of archaeological materials as a proxy for complex processes like the above-mentioned.

Recently, a growing scholarly attention paid to the human-object relationship has led to rethink the archaeological materials as flexible agents able to determine their own associations and actions rather than passive indicators of the human agency.

The aim of the paper is to analyze the export of Italic black-gloss tableware (IBG) in Portugal as an opportunity to investigate the possibilities of action of these artefacts. Starting from the analysis of paradigmatic Portuguese archaeological contexts, it will assess the chronology and the composition of different assemblages and then highlight the emergence of IBG's features in its trajectory from the production to the consumption practices.

07 THE BLACK GLOSS WARE IN THE ROMAN SARDINIA AS A CULTURAL BRIDGE FROM TRADITION TO INNOVATION

Author(s): De Luca, Gianna (Università di Cagliari)

Presentation Format: Oral

Food and cooking are always one of the strongest marker of ethnic and cultural identity. Roman world is no exception and nowadays, lots of its more tangible archaeological evidence, such as pottery, show that the acculturation's dynamics following the military conquest have been explicated through a “food fashion” exportation too. The Roman Sardinia is a good field of application to deepen material culture's knowledge: its early annexation to Rome and its geographic isolation have determined a complicated pottery-facies, in which the analysis of Black Gloss Ware is still an interesting topic because of the western Punic tradition and its opening to the new Roman maritime traffics. Aim of this contribution is to propose an overview around previous studies and new perspectives of research about Mediterranean circulation of this pottery, intended as privileged proof of the complex acculturation of Roman Sardinia, a land of neverending precarious balance between full romanization and indigenous traditions and customs. Furthermore, the paper will focus in a special way on the Sardinian unknown potteries manufactures, in line with the most recent researches into ceramics of the Roman world. The urban centre of Nora, in the south-west of the island, with its recent finds, is a very good starting point to analyze economic dynamics and their implications for the various local communities.

08 A PIECE OF AFRICA IN ROMAN SARDINIA. AFRICAN CULTURAL AND ECONOMIC INFLUENCES ON NORA (CAGLIARI SOUTH SARDINIA)

Author(s): Nervi, Cristina (MIUR)

Presentation Format: Oral

Nora is a Phoenician, Punic and Roman port in Southern Sardinia. The position of Nora - 200 kms far from Africa - creates a strong connection with the North African coast, since the Punic period. This strong connection originates a mixed culture: Sardinian and African (Punic), during the Punic period.

When the Romans arrive in Sardinia: the island becomes a Roman province in 227 BC, but the Norenses do not become Roman in a while; in effect they remain Punic - of African culture - in several features: their temples are similar to the North African ones, their pottery is Punic, as well as the names of some of its inhabitants are Punic of African origins.

The Romans find a well organized society and they do not change all in a while: the Romans use the Punic social and economic organization of Nora. Nora has a good economy, based on the trades and on the resources of its territory (mines, quarries and agriculture). The Romans take the control of the port, but do not change the organization of the landscape. The African uses and the Punic cultural influences on Nora still for about 200 years: it is only with the Princedom of Augustus that Nora becomes bit by bit Roman.

It is a long way along the centuries which brings the inhabitants of Nora to be really Roman; with some exceptions: for instance the local common ware is similar in some cases to the Punic types, even in 3rd AD, and the imports from Africa are strong till the 7th AD. The complex nexus Nora-Africa never give up over the ages, the kingdoms and the times.

09 NEW EVIDENCES FOR THE RESEARCH OF THE ROMAN URBANISM OF SAGUNTUM (SPAIN)

Author(s): Benedito-Nuez, Josep (Universitat Jaume I Castellón) - Melchor Monserrat, José Manuel (Museo Arqueológico de Burriana) - Ferrer-Maestro, Juan José (Universitat Jaume I Castellón) - García-García, Francisco - Buchón-Moragues, Fernando - Ferrandis-Montesinos, José (Universitat Politècnica de València)

Presentation Format: Oral

The high part of the city of Sagunto has traditionally been known as the archaeological sector, but recent excavations in the lower part have allowed the recovery of other monumental remains next to the river, some as spectacular as a probable forum and the circus. The new findings also include roads, engineering works, temples, houses and mausolea, which, together with pieces of sculpture and inscriptions, provide more information about the development of the municipality from the first pre-urban moments of the Iberian era, to full urbanization from the change of Era to the final moments of the Roman Empire. The models of urbanism used in this urban space have great similarities with others used throughout the Roman Empire, which involve major urban reforms and changes in land use, which until now had not been detected in the cities of the south of the Tarraconense province. In these moments a comparative analysis is being made with the urbanism of Ostia Antica, A multidisciplinary team of the Universities Politecnica of Valencia and Jaume I of Castellón, in collaboration with the Soprintendenza Archeologica di Ostia Antica, is developing this line of research, where archeology is combined with geophysical, digital analysis and revision of ancient archaeological interventions.

10 LAGOONS, MARSHES, ESTUARIES AS LOCALES OF ENCOUNTER AND CONFLICT: GEOARCHAEOLOGY IN THE STRAIT OF GIBRALTAR, 1300 CE TO 1540 CE

Author(s): Elbl, Martin Malcolm (The Portuguese Studies Review / Baywolf Press / Trent University)

Presentation Format: Oral

The paper summarizes preliminary results from the last three years of a research project on late medieval and incipient Early Modern (14th-early 16th centuries CE) "marginal" coastal environments in the Strait of Gibraltar, serving the functions of anchorage, heavy weather refuge, trading/victualling stop, locale for military operations and shipbuilding, and organic component of coastal defense. The geographical space reaches -- in the Maghrib -- from Targha/Oued Laou north-westward to Ceuta and then to Ksar es-Seghir, Tangier and further south to Asila, Larache, and Mehdia, and in the Iberian Peninsula from Gibraltar and Tarifa through Cadiz to Tavira/Faro, and westward to Albufeira, Portimão, Lagos and Cabo de S. Vicente. The project encompasses past estuarine lagoons, salt-marshes, coastal lagoons, dune fields, navigable back-barrier channels and drainage systems, as well as the historical hydrography and hydraulic regimes susceptible to exploration through computer modelling. The goal has been to establish a coherent multi-scalar reference model for this type of environments, in the Strait of Gibraltar area, through systematic coverage and re-examination of archival records, in tandem with the accumulated archaeological material currently published and/or repositored. The underlying dataset blends all hitherto identified cross-disciplinary data: from cross-institutional and private repositories of the material record to historical sources (starting with chronicles and embracing early modern and subsequent descriptive ethnographic or archaeological observations as well as data recorded within various fiscal, military, field survey, costal survey, roadbuilding, harbour construction, historical depth sounding, natural science and archaeology contexts). Wherever warranted by data density and quality the project deploys and applies earth science methods and concepts (geomorphology, geology, pedology, sedimentology, climate change studies, etc.). The endeavour is a macro-regional outgrowth of the still expanding "Pre-Modern Tangier (the Médina and Micro-Regional Context) Dataset Ver. 2.0," which was urban-focused and covered only discrete western portions of the Bay of Tangier.

a. ARCHAEOBOTANICAL REMAINS FROM THE MISTRAS LAGOON, CABRAS, SARDINIA

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Presentation Format: Poster

During the years 2014 and 2015 the Università degli Studi di Cagliari made two different excavations in the Mistras lagoon (Cabras, Central-West Sardinia), thanks to a ministerial authorization. The lagoon is situated next to the archaeological site of the ancient city of Tharros, and it probably was the area of its Phoenician and Punic harbour.

The excavations were done in the sandy barrier present in the middle of the lagoon. The stratigraphy is characterised by an alternation of sand, mud and *Posidonia oceanica* depositions. The archaeological layers reveal a frequentation of the area during the Phoenician and Punic period, from the 7th to the 3rd century BC.

Thanks to the waterlogged and the anoxic conditions, a large amount of seeds were found during the sieving of the sediment by wash-over. The macro-remains are kept in deionized water to prevent desiccation, and analysed with archaeobotanical procedures for their identification. The study is then integrated by seed image analysis, which helps in the characterisation.

The first analysis are revealing the presence of many cultivated or possibly cultivated plants species, in association with wild taxa that could as well have been used as food resources. One of the aims in the prosecution of the study will also be the recognition

of plants of local origin from the imports from outside the Island. This point is particularly interesting, considering that the actual lagoon was probably a harbour area during the Phoenician and Punic period, and that it is possible that at least some of the seeds found in the excavation are the remaining of ships cargo.

b. THE ROMAN VILLA A MARE DE SANT GREGORI IN BURRIANA (CASTELLÓN, SPAIN)

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Presentation Format: Poster

In this study we will present a summary of the documentation and excavation of the Roman site of Sant Gregori in the municipal district of Burriana (Castellón - Spain) is the only high-imperial Roman villa a mare that is being excavated now on the coast of the Valencia Community, and it is also the only one of these characteristics that is known at the moment between the river Ebro and the Turia. Up to now, 20% of the village has been excavated, specifically the peristyle area and the thermal baths that border the coast, corresponding to the main nucleus of the urban pars. Due to its geographical location, this settlement belonged to the ager saguntinus. The works are carried out by a multidisciplinary team from the Burriana Museum, Universitat Jaume I of Castellón and Universidad Politécnica de Valencia

Due to the high anthropization of the area, georadar is being used to detect the relationship between the coastline and the village, in addition to planning the successive excavation campaigns. The documentation of the excavation is complemented with the 3D laser scanning of the structures of the same.

The objective of this research project is to propose a model of villa a mare for the Levantine coast and establish the parallels with the villas that have been documented in the Iberian Peninsula, and with which it seems to have structural and chronological similarities.

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